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Science & Technology

***USSR: Science &
Technology Policy***

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CONTENTS

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| | |
|---|----|
| Decree on Efficiency of Work, Pay of Transport Workers | 1 |
| Decree on Competitive Designing | 2 |
| Evaluation, Introduction, Use of Inventions | 4 |
| Problems, Changes in Management of Sectorial Science | 11 |
| Work of Membrany Interbranch Complex Examined | 14 |
| Role of Novosibirsk Obkom in Restructuring of Production | 16 |
| Readers Ask About Information, New Wage System | 21 |
| Search for Information | 21 |
| New Wage System | 22 |
| Ivanovo-Sofia Scientific Production Association | 23 |
| Factors Behind Aging of Belorussian Science | 24 |
| Annual General Assembly of Uzbek Academy of Sciences | 28 |
| Session of General Assembly of Kazakh Academy of Sciences | 30 |
| Lithuanian State Prizes In Science, Technology For 1987 | 36 |
| Evaluation Of Work Of Scientific Institutes. Scientists | 38 |
| Zakyr Zakirovich Zakirov | 40 |

Decree on Efficiency of Work, Pay of Transport Workers

18140243 Moscow SOBRANIYE POSTANOVLENIY PRAVITELSTVA SOYUZA SOVETSKIKH SOTSIALISTICHESKIKH RESPUBLIK in Russian No 19, 1987 pp 381-383

[Decree No 303 of the USSR Council of Ministers of 12 March 1987: "On the Increase of the Efficiency of the Work and the Improvement of the Remuneration of the Labor of Workers of Scientific Research Institutes, Design and Technological Organizations, Associations, and Enterprises of Transportation"] [Text] 74. On the Increase of the Efficiency of the Work and the Improvement of the Remuneration of the Labor of Workers of Scientific Research Institutes, Design and Technological Organizations, Associations, and Enterprises of Transportation

The USSR Council of Ministers notes that the sectorial scientific research institutes and design and technological organizations of the USSR Ministry of Railways, the USSR Ministry of the Maritime Fleet, the USSR Ministry of Civil Aviation, and the ministries and departments of motor transport and the river fleet of the union republics are making a definite contribution of the acceleration of scientific and technical progress and the improvement of the work of transport on the meeting of the increasing needs of the national economy and the population for transportation.

At the same time serious shortcomings exist in the activity of sectorial science. The tasks on the development and introduction of new highly efficient means of transportation and control systems, which guarantee the safety and regularity of traffic, as well as the complete mechanization and automation of labor-consuming processes, the shortening of the time of the delivery of freight, and the increase of the standards of passenger service are being accomplished extremely slowly. With respect to many developments the time of the devising and assimilation of new equipment and technological processes has been dragged out, the new equipment being developed does not ensure the proper acceleration of the growth rate of labor productivity and the radical improvement of the operation of transport.

The remuneration of the labor of scientists, designers, and process engineers is inadequately linked with the end results of research and development and their introduction.

For the purposes of accelerating scientific and technical progress and increasing the interest of scientists, designers, and process engineers of scientific research institutions and design and technological organizations of transport in the development and introduction of advanced technologies and new means of transportation the USSR Council of Ministers resolves:

1. The executives of transportation ministries and departments, scientific research institutions, design and technological organizations, associations, and enterprises of transportation on the basis of the improvement of the economic mechanism:

—are to increase the role of sectorial science in the accomplishment of the tasks posed by the 27th CPSU Congress on the timely, high-quality, and complete meeting of the needs of the national economy for transportation, the increase of the economic efficiency of the operation of transport, and the acceleration of the growth rate of labor productivity;

—are to strengthen the contact of science with production and to intensify the interaction of scientific research institutions and design and technological organizations of transportation and industrial ministries and departments for the purposes of the integration of various forms of transport within the unified transportation system of the country and the development of highly efficient rolling stock, loading and unloading mechanisms, and other means of transportation.

2. Transportation ministries and departments and executives of scientific research institutes, design and technological organizations, associations, and enterprises of transportation are to concentrate the efforts of scientists, designers, and process engineers on the accomplishment of the tasks of scientific and technical process in transportation, taking into account the most important of them:

—the development and introduction of advanced technological processes and equipment, which ensure the intensification of the transportation process, the saving of fuel, energy, and material resources, and the improvement of the quality of transportation service of the national economy and the population;

—the increase of the reliability of means of transportation, the assurance of traffic safety, and the decrease of the harmful effect on the environment;

—the development and introduction on the basis of advanced computer and microprocessor equipment of automated control systems of transportation processes, which ensure the shortening of the time of the delivery of freight, the increase of the speed, and the increase of the level of regularity of the traffic of means of transportation;

—the development and extensive use of means of the mechanization and automation of production processes for the elimination of difficult manual labor, including robotized complexes for loading, unloading, repair, and maintenance operations.

3. To extend to the workers of scientific research institutions, design and technological organizations, associations, and enterprises of the USSR Ministry of Railways,

the USSR Ministry of the Maritime Fleet, the USSR Ministry of Civil Aviation, the ministries and departments of motor transport (motor transport and highways) and river transport of the union republics, and the administrations (associations) of urban passenger transport the conditions of the remuneration of labor, which were established by Decree No 462 of the CPSU Central Committee, the USSR Council of Ministers, and the All-Union Central Council of Trade Unions of 22 May 1985 (SOBRANIYE POSTANOVLENIY PRAVITELSTVA SOYUZA SOVETSKIKH SOTSIALISTICHESKIKH RESPUBLIK, No 21, 1985, Article 104), Decree No 1231 of the USSR Council of Ministers and the All-Union Central Council of Trade Unions of 17 October 1986 (SOBRANIYE POSTANOVLENIY PRAVITELSTVA SOYUZA SOVETSKIKH SOTSIALISTICHESKIKH RESPUBLIK, No 35, 1986, Article 182), as well as Decree No 85 of the USSR Council of Ministers of 20 January 1986 and Decree No 230 of the USSR Council of Ministers of 15 February 1986.

4. Ministries and departments and the executives of scientific research institutions, design and technological organizations, associations, and enterprises of transportation:

—are to ensure careful preparation for the introduction of the new conditions of the remuneration of the labor of scientists, designers, and process engineers with the extensive participation of labor collectives;

—are to strengthen the connection of the remuneration of the labor of workers with their personal contribution to the development and introduction of advanced technological processes and equipment, which ensure the radical improvement of the operation of transport, and to eliminate leveling in the remuneration of labor;

—are to implement measures on the seeking of the necessary assets by means of the improvement of the organization and rate setting of labor, the increase of its efficiency, the improvement of planning and the structure of management, the specification of the themes of work, the introduction of a computer-aided design system, the shortening of the time of development, and the fulfillment of work with a smaller number of personnel. Are to ensure the conducting of the comprehensive and objective certification of workers.

Ministries and departments are to examine the state of readiness of every institution, organization, association, and enterprise for the introduction of the new conditions of the remuneration of labor, are not to allow formalism in this matter, and are to ensure the complete utilization of the mechanism of the stimulation of the labor of scientists, designers, and process engineers.

5. The USSR State Committee for Labor and Social Problems and the USSR State Committee for Science and Technology are to give the necessary assistance and

to ensure the monitoring of the work of transportation ministries and departments, scientific research, design, and technological organizations of transportation on the improvement of the remuneration of the labor of scientists, designers, and process engineers.

[Signed] Chairman of the USSR Council of Ministers N. Ryzhkov

Administrator of Affairs of the USSR Council of Ministers M. Smirnyukov

Moscow, the Kremlin, 12 March 1987, No 305.

7807

Decree on Competitive Designing

18140242 Moscow SOBRANIYE POSTANOVLENIY PRAVITELSTVA SOYUZA SOVETSKIKH SOTSIALISTICHESKIKH RESPUBLIK in Russian No 21, 1987 pp 441-415

[Decree No 287 of the USSR Council of Ministers of 9 March 1987: "On the Organization of the Competitive Designing of Machine Building Products, Construction Projects, and Consumer Goods"] [Text] 79. On the Organization of the Competitive Designing of Machine Building Products, Construction Projects, and Consumer Goods

The task on the radical increase of the technical level and quality of products, which are being produced and developed, and projects, which are being planned and built, for the purpose of achieving the highest world level is posed in the decisions of the 27th CPSU Congress.

At present a significant portion of the newly developed products for production engineering purposes, consumer goods, and plans of construction projects do not satisfy the present requirements. The lack of creative competition among collectives of developers when performing planning, surveying, and experimental design work is one of the causes of the inadequately high technical level of many planning and design developments. In a number of instances this is due to the monopoly position of main organizations and the unsatisfactory use as a consequence of the know-how of skilled specialists of related sectors of industry, leading enterprises, institutes, and design bureaus. The creative activity and enthusiasm of a wide range of specialists directly in collectives of associations, enterprises, and organizations are being poorly developed, the initiative of personnel, who propose advanced solutions for the improvement of the indicators of the technical level and quality of the output being produced and the perfection of the technology of its production, is not being fully stimulated.

For the purposes of the extensive enlistment in urgent developments of collectives of creative organizations and individual specialists and the increase of the technical level and quality of the designs of items of machine building, construction projects, the modernization and

retooling of enterprises and works, materials and consumer goods, as well as technological processes the USSR Council of Ministers resolves:

1. To introduce starting in 1987 in the practice of the work of associations and enterprises, institutes and organizations the development and designing of products of machine building, advanced technological processes, construction materials, as well as construction projects and consumer goods on a broad competitive basis.

In case of the organization of competitions to proceed from the national economic significance of the items and construction projects that are being designed, the need for the assurance of the high technical level and economic efficiency of the designs, the substantial improvement of the qualitative indicators of the items, projects, and materials that are being designed, as well as the improvement of technological processes; here their technical level and quality should correspond to the work level or exceed it.

2. There are submitted for the competitions:

—for products of machine building—the designs of promising systems and completes of machines, which are of the greatest national economic importance, their component parts and elements, equipment, instruments, as well as advanced technological processes and construction materials, which ensure the significant increase of labor productivity, the complete automation of technological processes and works, the saving of all types of resources, and the competitive ability of the indicated items on the world market. Competitions can also be held for the purpose of the modernization of products that are being produced and the improvement of technological processes and materials;

—for construction projects—the designs (or their individual sections) of the construction, expansion, modernization, and retooling of large and complex enterprises, works, and facilities in the priority directions of the development of the national economy, the standard designs of buildings and structures, which contain fundamentally new technical and architectural layout solutions, the designs of the layout and building up of population centers or their individual regions, the designs of residential housing projects that are of great urban development significance, which ensure the comprehensive solution of socioeconomic and ecological problems, as well as the economical use of all types of resources;

—for consumer goods—the designs of complex household appliances and other consumer goods with the production of prototypes, which ensure the high consumer properties and competitive ability of these goods on the world market and the economical use of resources, as well as the designs of components, advanced technological processes, and construction materials for the production of consumer goods.

The objects of competitive designing are specified by the associations, enterprises and organizations, ministries and departments, which hold the competitions. First of all competitions should be held for the development of designs of items, which are of the greatest national economic importance, as well as items, the production of which is of a mass nature.

3. To establish that competitions are held:

—by associations, enterprises, and organizations—for the development and designing of items and construction projects in accordance with the products list that is attached to them;

—by ministries and departments—for the development and designing of complex and unique items and construction projects;

—by interbranch scientific technical complexes (MNTK's)—for the development and designing of products and technology in the direction of scientific and technical progress, which is attached to them;

—by the USSR State Committee for Science and Technology—for the development and designing of items, which are of the greatest national economic importance and of an intersectorial nature, as well as in accordance with the themes of the Comprehensive Program of Scientific and Technical Progress of the CEMA Member Countries to 2000;

—by the USSR State Committee for Construction Affairs—for the development of standard designs of buildings and structures, which contain fundamentally new technical and architectural layout solutions, and designs of the layout and building up of population centers or their individual regions.

4. Collectives of associations, enterprises, scientific research, design, planning, technological, and planning and surveying organizations, and higher and secondary specialized educational institutions regardless of their affiliation, clubs of independent creative technical work, other creative collectives, as well as individual specialists can participate in the competitions.

Organizations and citizens of the CEMA member countries can be allowed to enter the competitions.

5. To permit as an incentive the payment of a reward to the winners of the competitions in the following amounts:

—to associations, enterprises, and organizations—up to 5,000 rubles;

—to ministries and departments—up to 25,000 rubles;

—to interbranch scientific technical complexes—up to 30,000 rubles;

—to the USSR State Committee for Science and Technology—up to 40,000 rubles.

The specific amounts of the reward to collectives and individual participants are determined by the organizers of the competition.

The reward to the winners and participants in the competitions are paid regardless of other prevailing terms of the payment of bonuses (except for the management personnel of associations, enterprises, and organizations).

6. To pay the reward to the winners and participants in the competitions:

a) by associations, enterprises, and organizations—by means of assets of the material incentive fund;

—by interbranch scientific technical complexes—by means of assets of the material incentive fund of the associations, enterprises, and organizations, which belong to and are taking part in the work of the indicated complexes;

—by ministries and departments—by means of the assets which are intended for the payment of bonuses for the development and introduction of new equipment;

—by the USSR State Committee for Science and Technology—by means of the allocations which are earmarked for the expenses connected with the giving of awards to the participants in the Exhibition of USSR National Economic Achievements for the solution of the most important scientific and technical problems;

b) for construction projects:

—by associations, enterprises, and organizations—by means of the additional deductions for the high quality and economic efficiency of designs;

—by the USSR State Committee for Construction Affairs—by means of the assets intended for the organization of competitions on questions of designing and construction.

To establish that the client has the right to increase by up to 20 percent the amount of the additional deductions for the material incentive fund of planning and surveying organizations for the high quality and economic efficiency of designs which are developed on a competitive basis.

7. The financing of expenses on the holding of competitions is carried out by means of the assets, which are intended for scientific research, planning and design, and planning and surveying work, the fund for the development of production, science, and technology, as well as other sources, which are used for the financing of experimental design work.

8. The USSR State Committee for Science and Technology and the USSR State Committee for Construction Affairs are to draft with the participation of the USSR Ministry of Finance, the USSR State Committee for Labor and Social Problems, and the USSR Ministry of Light Industry and within 2 months are to approve model statutes on the holding of competitions in the corresponding directions.

9. The USSR State Committee for Science and Technology, the USSR State Committee for Construction Affairs, ministries and departments, interbranch scientific technical complexes, associations, enterprises, and organizations:

—for the purposes of accelerating scientific and technical progress and accomplishing specific production tasks are to establish a list of developments, which are being carried out on a competitive basis, the times of the holding of competitions, the forms and methods of tallying their results;

—in their practical activity are to use competitions to the maximum degree as an effective form of the development of advanced equipment and advanced materials and technological processes. Are to actively involve in this matter scientists and specialists and production innovators;

—are to create a creative atmosphere in labor collectives, are to use for the participants in the competitions various forms of moral and material stimulation, and are to promote extensively this advanced movement.

10. Ministries and departments and the Exhibition of USSR National Economic Achievements are to organize the extensive display of examples of products of machine building, construction projects, and consumer goods, which have been developed and designed on a competitive basis, and are to use the mass media for the promotion, preparation, and holding of competitions.

[Signed] Chairman of the USSR Council of Ministers N. Ryzhkov

Administrator of Affairs of the USSR Council of Ministers M. Smirnyukov

Moscow, the Kremlin, 9 March 1987. No 287.

7807

Evaluation, Introduction, Use of Inventions

18140241 Moscow *PLANOVOYE KHOZYAYSTVO* in Russian No 6, Jun 87 pp 17-26

[Article by Deputy Chairman of the USSR State Committee for Inventions and Discoveries Yu. Pugachev and E. Bunatyan, chief of a department of the USSR State Committee for Inventions and Discoveries, under the rubric "Restructuring: Results, Problems": "Organizational and Economic Problems of the Introduction of Inventions": first paragraph is *PLANOVOYE KHOZYAYSTVO* introduction]

[Text] The state of inventing activity in the country and the means of its improvement. The improvement of

scientific and technical evaluation and patent and license work. The selection of inventions and the organization of their planned use.

Under the conditions of the socialist economy inventions are becoming an integral part of the plans of economic and social development. During the 11th Five-Year Plan about 800,000 applications for inventions were submitted, 396,000 proposed technical solutions were recognized as them, and more than 120,000 were used for the first time. The economic impact as compared with the 10th Five-Year Plan increased by 1.6-fold and came to 14 billion rubles. The currency receipts from the sale of Soviet licenses with the use of new technical developments at the level of inventions increased. In 1986 more than 87,000 inventions were devised, about 23,000 were used for the first time, and the economic impact came to 3.6 billion rubles.

This contributed to the further increase of labor productivity and product quality, the development of new types of items of machine building, which are of the greatest national economic importance, the saving of material resources, the settlement of questions of the USSR Food and Energy Programs and environmental protection, and the mobilization of factors, which influence the improvement of the technical and economic indicators of the output being produced.

In recent years Soviet inventors have formulated many technical solutions, which have been included in the basis of equipment and technology, which are being newly developed.¹

At the same time in the development of creative inventing work there were also standstills. Such most important functions as the planning and management of invention for the purpose of the patent protection of the interests of the Soviet state in the area of innovations and the sharp increase of their technical level and national economic impact proved to be weakened. The majority of inventions, especially those devised in the process of research and development, are insignificant, are aimed at the improvement of the equipment being produced and operating technologies, and do not have an appreciable influence on the technical level of production.

This is also adversely affecting the patenting of Soviet inventions both in the quantitative respect and from the standpoint of efficiency in case of the sale of licenses and the export of industrial products. Thus, in 1986 with the fulfillment of the plan of currency receipts from the sale of licenses the number of major license agreements for highly efficient developments decreased sharply. In a number of sectors of industry in recent years not only have qualitative changes in inventing, efficiency, patent, and licensing work not occurred, but, on the contrary, with respect to many indicators the tendency to decrease has formed.

The most important criterion of the level of inventions and efficiency proposals is the results of their use in production and the economic or another impact in the national economy. In 1986 the number of used inventions as compared with 1985 decreased by approximately 10.5 percent and came to about 45,500. Of the 32 ministries, with respect to which a preliminary analysis was made, in only 7 of them did this indicator exceed the 1985 level, and then negligibly (on the average by approximately 6 percent). In a number of ministries the number of used inventions decreased substantially: in the Ministry of Construction of Petroleum and Gas Industry Enterprises—by 44 percent, in the Ministry of Machine Building for Light and Food Industry and Household Appliances—by 35 percent, in the Ministry of Power Machine Building—by 32 percent, and in the USSR Ministry of Light Industry—by 21 percent.

With respect to the number of inventions used for the first time in 1986 of the same 32 ministries only 11 exceeded the level of the preceding year; of them: the Ministry of the Gas Industry—by 28 percent, the Ministry of Railways—by 20 percent, and the Ministry of Tractor and Agricultural Machine Building—by 13 percent. The greatest lag behind the level of the preceding year is observed in the Ministry of Power Machine Building—31 percent, the Ministry of Machine Building for Animal Husbandry and Fodder Production—29 percent, the USSR Ministry of Land Reclamation and Water Resources—16 percent, and the Ministry of the Electrical Equipment Industry—15 percent.

In 1986 the economic impact of inventions and efficiency proposals exceeded 8 billion rubles. Of them 3.6 billion rubles were obtained just from the use of inventions, which is 12 percent more than during the preceding year. However, of the total increase of the economic impact (385.3 million rubles) the Ministry of the Automotive Industry provided 343.2 million rubles (or 89 percent), while all other ministries and departments provided only 42.1 million rubles. A number of leading ministries significantly reduced this indicator as compared with 1985: the Ministry of Heavy and Transport Machine Building—by 39 percent, the Ministry of Machine Building for Animal Husbandry and Fodder Production—by 34 percent, the USSR Ministry of the Petroleum Industry—by 28.5 percent, and the USSR Ministry of Power and Electrification—by 21.5 percent. As during the preceding year, more than 80 percent of the economic impact was obtained from the use of inventions with a saving of 100,000 rubles and more, the number of which came to approximately 15 percent of the number of inventions with a calculated impact.

Thus, the real content of invention, which for the present in its essence, level, and direction corresponds mainly to the extensive development of the economy, is revealed. Therefore, a radical change of inventing in the country is necessary.

In the press it is often emphasized that about 90 percent of the applications for inventions are received from scientific research institutes, design bureaus, and industrial enterprises, that is, through so-called official channels. At first glance this is good. The applications are submitted during the fulfillment of outlined plan assignments and the study of themes, which are aimed at the accomplishment of some tasks or others, which face the sector and the national economy of the country. But in spite of this, the following attracts attention: first, only about 50 percent of the claimed technical solutions are recognized as inventions; second, a quite large number of applications, although submitted in accordance with the so-called official principal, do not have any bearing on the themes which are elaborated in a planned manner.

It is necessary to prevent in every way the pursuit of the number of inventor's certificates, which do not yield the state the desired results. The question of the precise definition of the job-related invention has become urgent. In our opinion, it is possible to recognize as such the invention, which has been devised by the author on the instructions of or with the assistance of or with the use of means of enterprises, an organization, and an institution within their state planning activity. At the same time a new form of protection of job-related inventions should be established in the form, for example, of a patent passport, which would certify the recognition of the proposal as an invention, its priority, the authorship, and the right of the holder to prompt disposal. Moreover, it is important to specify that the job-related inventions, which are protected by patent passports, are state property. Such documents for a job-related invention should be issued to the enterprises, organizations, and institutions, at which it was devised, with the indication in it of the authors. It is necessary to issue to the latter certificates which certify that the declared invention belongs to them.

The solution of this problem will enable scientific research institutes, design bureaus, and enterprises to plan protectable themes more efficiently and to monitor better the activity of developers. Monitoring should encompass the entire set of operations—from the establishment of advanced technical assignments, the accomplishment of which would be impossible without new priority solutions, to the efficient use by developers of the most important economic levers and stimuli under the new conditions of management, which are based on self-financing, self-support [samookupayemost], and full cost accounting.

It is extremely important to increase the role and responsibility of the client, to give him the corresponding rights, and to provide him with a scientifically sound system of the forecasting of the development of technology. Without this one will not improve the situation, when a significant portion of the completed developments in their level remain lower than those developed

by technically advanced firms of the industrially developed countries. The proportion of developments, in which inventions are used, fluctuates within the range of 13-42 percent and for a long time has not increased (in the Ministry of Machine Building for Animal Husbandry and Fodder Production—13 percent, the Ministry of the Automotive Industry—20 percent, the Ministry of Heavy and Transport Machine Building—30 percent, the Ministry of the Machine Tool and Tool Building Industry—42 percent). In 1986 the proportion of developments, which exceed in technical level the best domestic and foreign analogs, came to 4.3-21.2 percent of their total volume (in the Ministry of Construction, Road, and Municipal Machine Building—4.3 percent, the Ministry of the Machine Tool and Tool Building Industry—5.3 percent, the Ministry of Tractor and Agricultural Machine Building—7 percent, the Ministry of Power Machine Building—21.2 percent).

The shortcomings in the organization of the planned use of inventions in the sectors of industry, especially the ones being implemented in conformity with the assignments of the state plan on the assimilation of objects of new equipment and technology, are arousing serious concern. The proper place in the plans of ministries and enterprises is still not being assigned to inventions. The state of the plans themselves of new equipment and technology on the scale of the country and by sectors testifies to this.

Ministries and departments are not ensuring the sharp increase of the qualitative content of the plans of new equipment by means of the extensive use in them of discoveries and inventions as the basis for the substantial increase of the efficiency of social production. This is having the result that a standstill of the process of "saturating" the theme-assignments with highly efficient inventions, which determine the possibility of achieving the maximum positive impact in case of the assimilation of the industrial production and the use of new equipment that is based on them, is being noticed even in the State Plan of USSR Economic and Social Development.

The situation could be different, if when determining the level of a new development on the basis of forecasts and strictly scientific criteria there was an opportunity to judge whether it is actually new and thereby to put an end to the subjective evaluation of its national economic significance and the advisability of inclusion in the plan. The question of introducing the state monitoring and evaluation of the scientific and technical level of new developments became urgent long ago. It is possible to accomplish such a task, for example, by establishing a special institute as the central organ in the system of state monitoring in the area of the management of the technical development of national economic complexes. An important place in its activity should be assigned to the evaluation of the level of completed developments (on the basis of the comparison of the indicators of this object with similar data of patent, scientific and technical, and market and economic information), as well as to

the analysis of the inventions used in them, their significance from the standpoint of the influence on the main properties of the object, patentability abroad, and patent purity, which as a whole predetermines the attainment of the world technical level and the competitive ability.

The USSR State Committee for Inventions and Discoveries could assume one of the important functions in the implementation of such an approach, by making a considered analysis of the world patent fund and the results of the state scientific and technical evaluation of inventions. This will also make it possible to increase the responsibility of developers for the end result of creative technical work. In the present situation they contribute half of the rejects in the form of refusals of the expert commission to issue inventor's certificates for declared technical solutions due to the lack in them of world novelty and do not bear any responsibility for this.

The analysis made by the USSR State Committee for Inventions and Discoveries shows that when the proportion of applications for inventions, which are submitted in the line of duty, comes to about 90 percent of their total number, the quality of invention remains low. During 1981-1985 only 52 percent of the declared technical solutions were recognized as inventions as against 56 percent during the 10th Five-Year Plan. This indicator was higher than during the preceding five-year plan for only one-fifth of the ministries. Thus, the labor of the large army of scientists, engineering and technical personnel, patent experts, and other specialists and considerable monetary and physical assets are nearly half wasted and are not aimed at the development of objects of equipment and technology of the highest world level.

The decrease of the level of the content and makeup of application materials due to the relaxation of the demandingness of developers and patent personnel of the applicant enterprises on the technical solutions, which, as they believe can aspire to inventions, is one of the causes of the formed situation. In the overwhelming majority of check applications technical and economic substantiations of the advantages of the declared technical solutions are made not entirely or not at all, the majority of the latter pertain to improvements of objects of equipment and technology. But it is time to hold strictly accountable for this whoever should be as the squandering of our national property. One should clearly separate creatively useful workers and those workers, who for years have not yielded any result. For example, the check of the All-Union Scientific Research Institute of Office Mechanization Facilities of the Ministry of Instrument Making, Automation Equipment, and Control Systems showed that of the 230 potentially creative workers only 20 (13 percent) proposed technical solutions at the level of inventions, while the others are not making any contribution to scientific and technical progress.

Of course, the scientific and technical evaluation, which is made by the institute of the USSR State Committee for Inventions and Discoveries, also requires cardinal

change. The urgency of this was confirmed in the Policy Report of the CPSU Central Committee to the 27th party congress, in which it was noted that "even the examination of applications for inventions at times is dragged out for years and is turning into a purgatory."²

It is well known that an invention is a technical means of solving one problem or another, but, as a rule, not a fundamentally new machine (instrument, device, equipment, material, technological process) as such. At the same time a potentially greater result, which is obtainable by society in case of its use (the increase of labor productivity, the saving of materials, and so on) by materialization in an object of equipment and technology, is incorporated in an invention. Therefore, it is necessary to take into account the twofold nature of an invention, which stems from its interdependence with the specific result of the use in production of the object of equipment, which contains this invention.

The consideration of the fact that society needs not only information on the means of solving some specific problems or others, but also to an even greater degree the most extensive use in the national economy of fundamentally new equipment and technology, is an important aspect of the problem of improving evaluation. Consequently, the procedure of the legal protection of scientific and technical achievements should be connected in a single complex—the development and legal protection of new machines, instruments, devices, equipment, materials, and technological processes. Such a connection is now possible within enterprises, organizations, and institutions on the basis of the principles of functional cost analysis. But on the scale of the sector, and especially national economic complexes, methods of connecting the technical and technological analysis with the assurance of the most complete legal protection have not been developed. In these cases the link between them falls apart for the reason that the same scientific and technical achievements are registered twice: as an application for inventions and as a report on scientific research or other investigative work. Moreover, the report simultaneously encompasses the entire set of scientific and technical results of development, while inventions are registered at different times, at any stage of the fulfillment of research and development.

Therefore, the establishment of a procedure, in case of which the evaluation of applications is made simultaneously with the enlistment of materials of research (investigative) and experimental design work, would be advisable. In other words, it is necessary to create the conditions so that the expert commission of the USSR State Committee for Inventions and Discoveries would meet halfway the developers of new equipment. However, one must not relieve enterprises and organizations of the responsibility for the results of patent research and the timely identification of the new things that developers have devised. The advantages of such an approach

consist in the fact that, first, the need for the scrupulous presentation of the essence of an invention disappears and, second, the latter will be attached to a specific object of equipment.

What forms of the making of an evaluation of inventions could be used under these conditions? This could be, for example, the establishment of special control over themes that can be protected with the immediate participation of experts in the process of key development. This could also be the additional evaluation by main organizations of ministries and departments of the need for the legal protection of developed inventions by way of the fulfillment of official assignments. Obviously, the direct submitting to the council of experts of reports on scientific research is also justified. None of these forms precludes the possibility of the traditional submitting of applications for an invention.

The changeover to this is difficult, since the reorganization of the activity of the state scientific and technical expert commission will be required, but the difficulties are made up for with interest by the advantages for the developers of new equipment and technology. Moreover, the opportunity being afforded for the making of statewide forecasts of the development of invention and the use of its results in practice is very important.

The patent law aspect of such a procedure of evaluating inventions does not cause misgivings. Indeed, the presence in an application simultaneously of several inventions is permitted both by Soviet legislation in the area of invention and by all the international treaties and agreements, to which the USSR is a party. It is important merely that the inventions would conform to the principle of the unity of general inventing thinking. Moreover, the attachment of a group of inventions to an object of equipment and technology will make it possible in accordance with this characteristic to determine the existence of the unity of general inventing thinking.

Along with this for the achievement of the optimum results when selecting objects of protection and for the proper orientation when selecting technical solutions, which are proposed for the evaluation of inventions, it is necessary to change radically the attitude toward patent research.

At the June (1986) CPSU Central Committee Plenum it was stressed that "until now the systems analysis of the latest world achievements has been lacking in our country" and "not very fresh foreign models are being taken as the standard."³ This is occurring because the most important enforceable enactment—All-Union State Standard 15011-82—which is called upon to regulate the procedure of conducting studies of the technical level and trends of development of objects of equipment and their patentability and patent purity at all stages of their life cycle, has not yet found application in the activity of scientific research institutes, design bureaus, and enterprises that are developers. Patent research with respect

to a significant number of developments is being performed in a poor-quality manner in sectors and does not provide an objective evaluation of the level and novelty of the technical solutions being developed.

The control checks of the patentability and patent purity of 375 new developments, which were made by the USSR State Committee for Inventions and Discoveries, showed that 38 percent of them in their technical and economic indicators are inferior to foreign analogs.⁴

At the same time there are also quite a number of good examples. Thus, at the TsNIImash Scientific Production Association inventing, patent, and license activity is an integral part of scientific research. When formulating the draft of the thematic plan the technological operations are specified and classified from the standpoint of their ability to be protected, that is, the fundamental ability to accomplish basic technical tasks by the development of inventions. The annual plans of patent research, which is conducted by the forces of the scientific departments under the procedural supervision and with the immediate participation of the highly skilled patent department, are drawn up on this basis. Moreover, the patent research encompasses all the stages of the fulfillment of scientific research work, including the substantiation of the theme at the preplanning stage, at which the world technical level is established and the patent situation in the USSR and abroad is evaluated. More than 90 percent of the protectable themes are protected as inventions. During the 11th Five-Year Plan and in 1986, 27 license agreements on 30 objects were concluded. More than 30 inventions, which were devised and used in 1986 in the national economy, provided an economic impact of about 2 million rubles.

However, the positive experience did not find extensive dissemination. At many scientific research institutes and design bureaus patent research has not yet become an effective means of studying world models of equipment and increasing the effectiveness of inventing, patent, and license activity and, as a consequence, the technical level of developments. There are ministries which approve the thematic plans of research and development without carefully conducted patent research. As a result considerable assets are spent on the elaboration of already known technical solutions. Precisely for this reason scientific research institutes and design bureaus, which are called upon to be centers of the development of truly new, advanced equipment, which is based on inventions, frequently issue technical solutions, which do not make radical changes in the development of production and do not have a substantial influence on the increase of its efficiency.

The results of the formulation in sectors of general technical requirements with long-range indicators for similar products to 1990 are an example of the aspiration of many ministries to operate in the old way. The expert commission of the USSR State Committee for Inventions and Discoveries established that more than

42 percent of the indicators are inferior as compared with similar machines, instruments, and other equipment which is already being produced abroad.

The technical administrations of ministries and departments should increase the accountability of managers of scientific research institutes and design bureaus for the quality and efficiency of research and development first of all on the basis of the improvement of inventing, patent, and license work. It is important that competent specialists, who have a thorough professional command of technical, economic, and special legal knowledge in the area of patent affairs, would conduct it.

Many managers of enterprises and organizations in practice have become convinced of the necessity of patent services and are sparing no assets for their reinforcement with highly skilled personnel and supply with the latest equipment. However, the formation of such services is frequently treated disdainfully or formally, which adversely affects the organization of invention and deprives the developers of new equipment of effective skilled assistance.

Some steps on the formation of unified subdivisions for patent, license, inventing, and efficiency work have been taken in a number of ministries and departments. The results of the conducted all-union one-time registration of information on the size and the expenditures on the maintenance of patent services showed that 5,750 patent, license, inventing, and efficiency subdivisions, in which about 30,500 specialists work, are operating in the national economy. It is possible to add to them approximately 17,000 individual inventors, who most often combine this work with official duty. In all 42 percent of the patent services are independent, while the remainder operate with the rights of intrastructural groups, sectors, and bureaus and within various subdivisions and, consequently, have limited possibilities. However, far from all ministries and departments have completed the formation of such subdivisions. Moreover, at times individual managers on the pretext of improving the management system attempt to reduce the staffs of patent workers. Such a situation is entirely intolerable.

Under present conditions the patent services require the closest attention. They should become the central units in the mechanism of the management of the process of developing new, competitive equipment and indispensable assistants of scientists, designers, and process engineers.

The choice of inventions and the organization of their planned use were and remain one of the most urgent and difficult problems. At present several steps are being taken in this respect. In particular, for the purpose of speeding up the introduction in production of major inventions of an intersectorial nature the Interdepartmental Commission for questions of their planned use was established in 1985 under the USSR State Planning

Committee. In the past period the commission has examined and elaborated recommendations for the inclusion of seven assignments in the drafts of state plans. The USSR State Committee for Inventions and Discoveries and the State Committee for Science and Technology formulated proposals for the inclusion in the State Plan of USSR Economic and Social Development 44 assignments on the assimilation during 1987-1990 of more than 150 major inventions.

However, such steps solve the problem only in part. It must be admitted that the USSR State Committee for Inventions and Discoveries, ministries, and departments are not ensuring the rapid development of inventing work in the country and, what is the main thing, its great efficiency.

Such use of inventions, so that they in essence would influence the technical level and efficiency of the new equipment and technology that are being developed, is needed. This is dictated by the changeover of sectors of the national economy to cost accounting, self-financing, and self-support [samookupayemost]. The urgent need has arisen for the development of a common system for all sectors of the national economy of the choice of inventions, which are capable of having an appreciable influence on the pace of scientific and technical progress. Such a system should encompass all levels of management. It is also important to develop an organizational and economic mechanism of the planning of their testing and rapid introduction in the national economy. This will make it possible to establish priorities in planning, financing, material supply, and so on.

Thus, the task is to select by means of the objective evaluation of the significance of some versions or others of technical solutions the most promising inventions, which promote as much as possible the acceleration of scientific and technical progress, the intensification of the economy, and the most complete meeting of the social needs of society. The development of a methodology of evaluating the national economic significance of inventions, particularly at the early stage of their life cycle, could be the most important prerequisite of the accomplishment of this. The topicality and promise of inventions and the degree of their influence on the achievement of the basic technical and economic parameters of the object of equipment with the satisfaction of the requirement on the exceeding of the world level and the full national economic impact of anticipated use should be the main criteria of evaluation. Such criteria are being proposed with allowance made for the steps taken in recent times in this direction, including the All-Union Competition for the Devising of Methods of Evaluating the Significance of Inventions, which was held in 1986 by the USSR State Committee for Inventions and Discoveries and the Central Council of the All-Union Society of Inventors and Efficiency Experts and for which about 250 works were submitted. The

listed criteria should become the basis for the preparation of the corresponding methods and a standard procedural document, which specifies the methods of evaluation, its performers, the stages, the registration of the results, and so on.

The development of a scientifically sound system of the selection of the most important inventions predetermines the need for the preparation of qualitatively new synthesized survey information, which is based on the classification analysis of declared technical solutions in the priority directions of science and technology. This information should also include an evaluation of the patent situation in competing technical spheres.

It is advisable for the USSR State Committee for Inventions and Discoveries to make a survey of inventions at the stage of state patent examination by the forces of a specially established group of highly skilled experts—prominent scientists, inventors, leading specialists of various sectors of the national economy, and others. Such a group, which has been united into a structural subdivision, could at the first stage consist of 50-60 people, who, by directing attention to the priorities of the basic directions of the technical development of sectors of the national economy, would make the choice of the most important inventions. Moreover, the choice should be made in interconnection with the specific objects of equipment and technology, which have embodied such inventions, and their readiness for industrial assimilation. It is also important to settle the questions of the remuneration of the labor of these specialists.

Along with the USSR State Committee for Inventions and Discoveries, ministries, departments, and national economic complexes within the framework of the common system for all sectors should make the choice of inventions, which are of intersectorial importance, using for these purposes competitions, trade fairs, exhibitions, reviews, and so on. The introduction of inventions on the basis of the inclusion of assignments on testing and industrial assimilation within objects of equipment and technology, in which they are used, is a continuation of the work on their selection and its logical consequence and goal. However, it is impossible to achieve this by the traditional method. It is necessary in consultation with the USSR State Planning Committee and the State Committee for Science and Technology to change over to the planning of the introduction of the most important inventions within the five-year and annual state plans of economic and social development of the USSR and the union republics and the plans of ministries and departments on the basis of state orders. Here it is important that planning would encompass the entire cycle—from the development of an invention to the meeting of the need of the national economy for new equipment of the world level. Planning should envisage the inclusion in the special new section "The Introduction of Discoveries and Inventions" of the state plan of work (state orders): on the preparation of inventions for introduction (the

conducting of research and development); testing—the development of mockup, experimental, pilot, and pilot industrial objects and pilot technologies; the assimilation of objects of equipment on the basis (with the use) of inventions in industry and other spheres of the national economy; commercial production in volumes of the possible meeting of the needs of the national economy of the country.

The functioning of such a mechanism of the introduction of inventions will become possible, if the state plans contain objects of equipment and technology, which ensure the achievement or exceeding of the world level and the implementation of statewide, social, and ecological programs. For this the All-Union Center of Patent Services of the USSR State Committee for Inventions and Discoveries needs to evaluate the significance and the conformity to the world level and competitive ability of all objects of equipment and technology which are included in the drafts of plans of different levels with respect to the section "The Introduction of Discoveries and Inventions."

In order to accomplish these and other changes it will be necessary to make fundamental changes on the laws on invention. At present the basic document of the protection of the state priority of new technical solutions is the inventor's certificate for an invention, of which the state is the holder. At the same time the belonging of an invention to it does not establish the specific holder in the person of the state. And it turns out that the invention belongs to everyone and no one.

In this connection it is necessary to change over to cost accounting principles of the use of inventions. First of all it is important that the enterprises, organizations, or institutions of the sector, in which it originated, would be considered the owners of the job-related invention, who have been given the rights of its disposal. In case of its use by other enterprises contractual terms of transfer on the basis of the principles of cost accounting, that is, with the compensation of expenses, the transfer of a portion of the profit, and so on, should be in effect. Here the state should retain the right of transfer of one invention or another to other interested enterprises.

It is also necessary to give the system of academies of sciences and the higher school the right of ownership of "their own" inventions and, in essence, to hold auctions on their sale (transfer) to those enterprises, which are interested in them. With respect to inventions, which have been devised by way of initiative by individual authors, two approaches are possible. First, promotion, the organization of work on the implementation of inventions, the evaluation of utility and significance, and transfer on a contractual basis to enterprises for introduction—it is possible to assign all this to the All-Union Society of Inventors and Efficiency Experts. Second, the USSR State Committee for Inventions and

Discoveries could assume the organization of the registration and monitoring of their introduction on the scale of the country, reflection in state statistical reporting, and the centralized payment of the reward to the authors.

Frequently the misgivings are expressed that now, when inventions are offered for use free of charge, the contractual system and the cost accounting approach proper will decrease the number of their introductions throughout the country. It seems that this will not occur. The demand on enterprises to ensure the output of products of the highest world level and the introduction of sanctions for the output of obsolete machines, equipment, instruments, and materials are objectively leading to the need for the search of new technical solutions, and not only "one's own," but also "others'." Moreover, the system of compensation of the expenditures for the first use and the obtaining subsequently of a profit will lead to the stepping up of introduction, will decrease the degree of risk, and will create interest.

The restructuring of the activity of the USSR State Committee for Inventions and Discoveries proposes to assume all the responsibility for the coordination of inventing, patent, and license work in the country and for the increase of the technical level of production in the sectors of the national economy. Its influence on the efficiency of the inventing, patent, and license activity of ministries, departments, and national economic complexes in the process of the development and rapid introduction of the latest equipment and technology of new generations, which are based on discoveries and inventions, has to be increased sharply. For this it is necessary to constantly improve and intensify the analysis of invention, to know the state of affairs locally, to reveal the true causes of shortcomings and negative trends, and to achieve closer and more fruitful contacts with ministries, departments, union and autonomous republics, krays, and oblasts of the country.

Footnotes

1. For example, the low-temperature technology of producing cement decreases fuel consumption to two-fifths with the simultaneous increase of the yield and grade of cement by 20-30 percent and the decrease of the cost of the production of clinker. The smelting of cupric concentrates in a molten pool increases the specific furnace capacity by five- to sevenfold and decreases the specific consumption of fuel to two-sevenths. The annual economic impact here at one mining and metallurgical combine alone came to more than 1.4 million rubles. A vertical NC grinder machines complex spatial surfaces and yields an annual economic impact of about 850,000 rubles. The assimilation of the production of special reflectors of the headlights of vehicles got rid of imports, increased the service life of headlights by 30-40 percent, and decreased the labor intensity of their production. With the production of 10 million units an economic impact of 2 million rubles was obtained. Cross

taper rolling mills are protected by more than 150 inventor's certificates for inventions. The metal utilization ratio in case of their use reached 0.8-0.95. The KIM-600 m plate measuring machine, which is intended for the measurement of dimensions, the forms and relative position of the geometric surfaces of parts, and the parameters of bodies of rotation, in its indicators surpasses similar Japanese and American machines.

2. "Materialy XXVI syezda Kommunisticheskoy partii Sovetskogo Soyuza" [Materials of the 27th Congress of the Communist Party of the Soviet Union], Moscow, Politizdat, 1986, p 29.

3. "Materialy Plenuma Tsentralnogo Komiteta KPSS, 16 iyunya 1986 g." [Materials of the CPSU Central Committee Plenum, 16 June 1986], Moscow, Politizdat, 1986, p 17.

4. Thus, the REM-100U general-purpose scanning electron microscope (the Ministry of Instrument Making, Automation Equipment, and Control Systems) as compared with the foreign analog has ten thirty-thirds the resolution, a fiftyfold greater pressure in the column of the microscope, a fourfold greater power consumption, a large weight and area, and small dimensions of the specimen: ten thirty-thirds as great in diameter and half as thick. The technological line for the production of ethylene with a capacity of 300,000 tons a year (the Ministry of Chemical and Petroleum Machine Building), which took more than 10 years to develop, is one fifth-eighth as good as the foreign analog in the consumption of electric power per ton of ethylene and 7 percent inferior in the consumption of raw materials. The proportion of developments, which do not have patent purity with respect to industrially developed countries, is high. During the 11th Five-Year Plan it came to 32 percent.

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7807

Problems, Changes in Management of Sectorial Science

18140240 Moscow *EKONOMICHESKAYA GAZETA* in Russian No 31, Jul 87 p 17

[Article by Candidate of Physical Mathematical Sciences N. Obratsov and Candidate of Economic Sciences A. Solovyev under the rubric "Scientific and Technical Progress: Problems and Solutions": "To Full Cost Accounting. On the Means of Restructuring the Management of Sectorial Science"; first paragraph is *EKONOMICHESKAYA GAZETA* introduction]

[Text] The acceleration of scientific and technical progress presumes, as was noted at the June (1987) CPSU Central Committee Plenum, the direct involvement of science in production. But for this it will be necessary to change radically the organizational forms and methods of work of scientific organizations.

In recent times steps on the cardinal restructuring of VUZ science have been taken and profound changes have been occurring in the organization and management of the activity of academic scientific organizations. The restructuring of sectorial science, which includes more than two-thirds of the entire scientific and technical potential of the country, is still occurring slowly. At the same time precisely sectorial scientific institutions are the key link in the structure of the national economic complex, which can and should ensure the steady acceleration of scientific and technical progress.

Until recently sectorial science was developed exclusively by extensive methods: in case of the emergence of a new scientific and technical task additional material resources and limits of the number of workers were allocated, or else new scientific research institutes or design bureaus were entirely established. As a result the number of scientists in the sectors of industry has increased in the past 15 years by two-thirds. The financial outlays on the activity of scientific organizations, which as a whole for the sector "Science and Scientific Service" now amount to more than 30 billion rubles a year, increased and continue to increase even more rapidly.

What are the economic result and the scientific and technical result of the activity of sectorial scientific organizations? What difficulties will one have to face during the introduction in practice of the new forms of their management?

The Expenditures Are Increasing More Rapidly

The average annual number of produced models of new equipment during the past five five-year plans has steadily decreased and came last year to less than 3,500, which is 25 percent less than a quarter century ago. Here the expenditures on the development of new equipment per scientific and technical measure, which has been introduced in production, are constantly increasing (the 9th Five-Year Plan—11,800 rubles, the 10th Five-Year Plan—12,300 rubles, the 11th Five-Year Plan—14,000 rubles). The expenditures per developed model of new equipment are increasing even more rapidly: during the 9th Five-Year Plan—1.5 million rubles, during the 10th Five-Year Plan—2.3 million rubles, during the 11th Five-Year Plan—3.3 million rubles.

As is known, the number of conditionally released workers in the national economy as a result of the introduction in production of measures on new equipment is one of the basic indicators of the effectiveness of science and scientific and technical progress as a whole. In recent years this quantity has been increasing very slowly and in 1986 barely exceeded 500,000. At the same time the freeing of each worker costs the national economy more and more and now comes to nearly 25,000 rubles. Calculations show that last year twofold more measures

on new equipment were introduced than workers were freed. It will hardly be possible by such inefficient measures to drastically accelerate technical progress in production.

Such are the basic economic indicators of the activity of sectorial scientific organizations. They are regularly supplemented by low scientific and technical results and a very negligible influence on industry. Thus, more than 10 years were required to increase to 39.2 percent the proportion of the products of machine building, which are assigned to the highest quality category. How many years will be needed, if things also proceed in the future at the same pace, to bring this indicator up to the level that was specified by the 27th CPSU Congress for 1990?

The lag of the technical level of developments with respect to the basic machine building products is especially pronounced. The majority of types of equipment, which was developed before 1986 in the Ministry of the Machine Tool and Tool Building Industry, the Ministry of the Electrical Equipment Industry, the Ministry of Instrument Making, Automation Equipment, and Control Systems, and the Ministry of Machine Building for Light and Food Industry and Household Appliances, did not satisfy the requirements of the highest world level.

Statistics show that serious difficulties also exist in case of the large-scale use of scientific and technical achievements in practice. Thus, 97 percent of the introduced inventions are used at only one enterprise and only 0.5 percent are used at three to five. This testifies that the potential, to which scientific thought is giving rise, is being used extremely unsatisfactorily.

What is it necessary to do in order to change radically the negative trends of the activity of sectorial scientific organizations and to do away with the drag mechanism in science?

The Sources of Losses

First of all it is necessary to determine properly the causes, which hinder the effective functioning of the scientific and technical potential, and the factors which ensure the intensification of science under present conditions.

In our opinion, there are several basic causes of the negative trends of development of modern science. It is necessary to begin with the fact that the state budget nature of financing does not stimulate the quickest achievement of the end result—the introduction of a development in production. Moreover, the Unified Fund for the Development of Science and Technology under the conditions of the weakness of cost accounting levers is becoming, in essence, another of the forms of state subsidies.

The existing plan indicators—the limit of the number of workers, the cost of performed work, thematic assignments—do not reflect at all the contribution of scientific research institutes and design bureaus to the solution of the problems of the sector.

The technical equipment of the pilot works of scientific research institutes leaves much to be desired. At many of them it is possible to see much older equipment than in the shops of industrial enterprises. Not to mention the fact that a number of organizations simply do not have pilot experimental subdivisions.

The lack of a basic reserve is seriously hindering the development of science and technology. This is explained by the fact that sectorial institutes do not have economic stimuli which aim them at the performance of long-range research work.

The isolation of sectorial science from academic science, its confinement to the fulfillment of developments, which are aimed at the partial improvement of already achieved results, and the constant orientation toward available foreign analogs are also increasing. The increasing amount of operations, which are not characteristic of science and are being performed on the instructions of superior organs of management of the sector and the share of which for many ministries comes to about one-third, is an inevitable result of this trend.

The generalization of the results of the activity of sectorial scientific research institutes and design bureaus and the results of state (extradepartmental) and departmental checks, which were made by the State Committee for Science and Technology in 1984-1987, shows that fundamental restructuring in science is possible only on the condition of the change of the entire organizational and economic mechanism of the functioning of the sector "Science and Scientific Service." The changeover of scientific and technical organizations to the principles of full cost accounting is the basic guarantee of the accomplishment of the tasks of restructuring. Along with the increase of administrative responsibility this will make it possible to increase their economic interest in the results of economic activity.

The checks of individual organizations and the comprehensive analysis of the results of the scientific and technical activity of ministries and departments showed that there are scientific subdivisions, which have a significant influence on the increase of the technical level of production and its efficiency. Thus, the Tekhnenergokhimprom Scientific Production Association of the USSR Ministry of Mineral Fertilizer Production developed new energy-saving technologies and systems of the thermal neutralization and processing of highly toxic production waste. The introduction of the developments of this scientific production association made it possible during the 10th and 11th Five-Year Plans to save about 2 million tons of standard fuel, to purify 2.5 billion cubic meters of water, and to process and render harmless

more than 10 million tons of highly toxic industrial sewage. Here is another example: at the All-Union Scientific Research Institute of Synthetic Rubber imeni S.V. Lebedev about 80 percent of the performed research is protected by inventor's certificates, while the actual economic impact from the use of the developments of the institute during 1981-1984 alone exceeded 24 million rubles. At the Khimavtomatika Scientific Production Association of the Ministry of the Chemical Industry practically all operations conclude with introduction in production. Suffice it to say that during the years of the past five-year plan this association exported 40 descriptions of its products to 17 countries and 12 inventions were patented abroad.

At the same time many organizations continue to work inefficiently. Thus, state checks during 1985-1986 revealed that the long-range technical tasks of the machine building complex were not taken into account in the basic directions of the activity of the State Planning and Scientific Research Institute of Industry for the Production of Products for General Machine Building Purposes of the Ministry of the Machine Tool and Tool Building Industry. At the Moscow Affiliate of the All-Union Scientific Research Institute of the Peat Industry of the RSFSR Ministry of the Fuel Industry less than a third of the total volume of themes corresponded to the main directions of the activity of the institute.

The functions of many organizations as before reduced merely to the fulfillment of assignments, which are connected with the activity of the staff of the ministry, or to the engineering and technical support of an operating production process. Thus, the recently abolished Scientific Research, Planning, and Design Institute for Complete Technological Lines of the Ministry of Chemical and Petroleum Machine Building was actually converted into an administrative subdivision of the Main Administration of Aggregate Deliveries of Equipment and Technological Lines for work with industrial enterprises.

Several institutes do not want to assume direct responsibility for the technical level of production and the quality of the output being produced in accordance with attached themes. Thus, of the total number of jobs, which were completed in 1985 and were performed at the same State Planning and Scientific Research Institute of Industry for the Production of Products for General Machine Building Purposes, given an amount of financing of 2.3 million rubles only three developments were introduced, and this was not at industrial enterprises, but in administrations of its own ministry.

The Principles of Restructuring

The comprehensive approach to the restructuring of sectorial science should, in our opinion, consist in the fact that the provisions of the Law on the State Enterprise (Association) should be applied to scientific organizations. It is necessary to organize their activity on the basis of the principles of full cost accounting, self-financing, and self-support [samookupayemost].

The practical implementation of these principles will require a significant change of the economic management interrelations of scientific organizations with superior organs and with the clients of scientific and technical products. Ministries, it was stressed at the June CPSU Central Committee Plenum, should in practice become the scientific and technical headquarters of the sectors and be answerable to the country for the attainment of the world level of production technology and the quality and technical level of products.

The USSR State Committee for Science and Technology should bear responsibility for the fulfillment of the most important intersectorial and priority national economic problems.

Scientific organizations will become the key unit of the new organizational and economic mechanism of the management of science, since the changeover to full economic independence is sharply increasing their role in the structure of management.

The economic essence of the new economic mechanism in science, in our opinion, should reduce to the direct and complete dependence of the revenues of the organization on the national economic efficiency of its work and the real influence on the final indicators of the activity of the corresponding sector (subsector). Here the organization should be completely free in the choice of the methods of forming and using its own scientific and technical potential.

7807

Work of Membrany Interbranch Complex Examined

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p 2

[Article (TASS): "An Important Direction of Scientific and Technical Progress"]

[Text] In the strategy of acceleration, which was formulated by the April (1985) CPSU Central Committee Plenum, the intensification of the integration of science with production is one of the main tools of the transformation of the socialist economy.

The development of fundamentally new machines and technologies and the rapid and large-scale introduction of developments in practice are acquiring the greatest importance. But what is new in science often originates at the meeting points of its various fields.

Precisely for these purposes the CPSU Central Committee deemed it necessary to organize interbranch scientific technical complexes (MNTK's). They make it possible to eliminate interdepartmental barriers, to unite the efforts of a wide range of scientists, designers, and

production workers, and to accomplish a scientific and technological breakthrough in the main directions of the development of the economy.

The Membrany Interbranch Scientific Technical Complex is one of the large interbranch scientific technical complexes of the country. More than 30 organizations and enterprises of 13 ministries and departments are participating in its work.

A meeting of the party and economic aktiv of the complex, at which the results of the work of the Membrany Interbranch Scientific Technical Complex and the tasks on the fulfillment of the decrees of the party and government on the development of membrane technology in the country were discussed, was held in Vladimir on 27 May.

In the report of L.I. Pokrovskiy, general director of the interbranch scientific technical complex, and in the statements of President of the USSR Academy of Sciences G.I. Marchuk, Deputy Chairman of the USSR State Committee for Science and Technology K.M. Dymayev, Deputy Chairman of the USSR State Planning Committee A.I. Lukashov, USSR ministers V.M. Lukyanenko, L.B. Vasilyev, and Yu.A. Besspalov, First Secretary of the Vladimir Oblast Committee of the CPSU R.S. Bobovikov, Deputy Chairman of the Interdepartmental Membrane Commission of the USSR Academy of Sciences V.A. Legasov, and others the state of affairs was analyzed objectively and in a self-critical manner and it was noted that the work of the interbranch scientific technical complex has not yet acquired the proper scale and scope. The drawn out organizational period is not making it possible to use efficiently all the possibilities and reserves.

Member of the Politburo of the CPSU Central Committee and Secretary of the CPSU Central Committee L.N. Zaykov spoke at the meeting.

He noted that during the current five-year plan with the use of membranes it is planned to obtain a good deal of ultrapure chemical substances, caustic soda, ammonia, and varnish and paint materials and a large quantity of protein additives. The accomplishment of everything planned will yield an economic impact of nearly 1 billion rubles.

Another important merit of membranes consists in the possibility of the solution of urgent ecological problems and the extensive introduction of completely waste-free works. Literally fantastic results are being achieved in the food industry. The processing of whey with the use of membranes will make it possible to additionally produce a large amount of proteins, lactose, and vitamins for use in children's food products and the production of butter, cheese, and meat and baked goods.

Taking into account the exceptional importance of the rapid development of membrane technology, the party Central Committee and the USSR Council of Ministers have adopted a number of decrees, in which major steps on the strengthening of the pilot and industrial base in this area are outlined. The interbranch scientific technical complex was organized for these purposes.

However, the Membrany Interbranch Scientific Technical Complex for the present is obviously not coping with the posed tasks and is not ensuring the development in the shortest possible time of qualitatively new technologies and equipment and their large-scale introduction in the national economy. Enterprises and organizations for the present are merely registered as being part of the interbranch scientific technical complex, but in practice are continuing to operate in isolation, by obviously obsolete methods.

Direct ties between collectives with intensified integration and cooperation have never been put into effect. The membrane problem in the themes of the organizations of the interbranch scientific technical complex have not received priority expression, the pilot experimental base is being strengthened slowly.

Radical changes have not occurred first of all in the main organization of the complex—the Vladimir Polimersintez Scientific Production Association. The collective is living mainly due to the scientific reserve that existed. In the development of new types of equipment they have never gone here beyond production prototypes. The equipment, on which they are being produced, does not satisfy the present requirements.

The scientific forces of the association as before are dispersed among many directions, membrane technology is one of several other problems which have been assigned to the collective.

It is difficult to count on a cardinal change of the state of affairs and the quickest bringing of membrane equipment up to leading levels, if a radical change in the activity of scientific research and design organizations of the machine building complex does not occur.

In chemical machine building the development of highly productive and reliable equipment for the production of membranes is one of the main, priority directions, which predetermines revolutionary changes of not only the organization, but also the very nature of labor in the chemical industry.

This is precisely the link, by having taken hold of which it is possible to actually accomplish a breakthrough in the chemicalization of the national economy and to actually obtain a manifold gain of time in progress. To master membrane technology means in practice to bring many sectors of the economy up to leading levels and to

lend genuine dynamism to its development. M.S. Gorbachev specified in precisely that way the tasks connected with the acceleration of scientific and technical progress.

The following example, in particular, was cited: in the sectors of the agroindustrial complex about half of the available units are not operating, the remainder are operating at far from full capacity. The reason is design errors and production defects. Last year at the enterprises of the State Agroindustrial Committee only a little more than 70 percent of the raw materials of the established assignment were processed in accordance with advanced technology. The new methods of storing fruits and vegetables are being used poorly.

A few days ago a conference, at which the progress of the fulfillment of the decrees of the party and government on the development of the processing sectors and storage base of the agroindustry was examined, was held in the CPSU Central Committee. Particular emphasis was placed on the rate of development of machine building for the food industry. Without highly productive equipment, without advanced technologies of the storage and processing of agricultural products, in short, without retooling radical improvements in the solution of the food problem cannot be achieved.

Membrane technology is needed not for the sake of fashion, but for the decisive acceleration of scientific and technical progress, for the intensification of production and the increase of product quality on its basis.

The meeting participants devoted much attention to questions of the modernization and retooling of the enterprises and organizations which belong to the interbranch scientific technical complex.

The influence of party committees should appear fully in the accomplishment of the tasks, which have been set for the interbranch scientific technical complex, and the increase of the efficiency of its activity. A specific person is behind each assignment and behind each specific job. The monitoring of the progress of the fulfillment of adopted decisions should be a vital matter of party organizations locally and the party committees of ministries and departments. Closer attention should be devoted to the solution of social problems.

With allowance made for the fact that the main organization of the interbranch scientific technical complex is located in Vladimir, a special role in the monitoring of its activity is being assigned to the Vladimir Oblast Committee of the CPSU. One must not wait, but act, accomplish more rapidly the settlement of all organizational questions, and do the work in such a way that here there would be a genuine center of membrane equipment of the country.

Chief of the Chemical Industry Department of the CPSU Central Committee V.G. Afonin, USSR Ministers V.A. Bykov and N.V. Lemayev, secretaries of a number of oblast committees of the CPSU, and scientists and specialists of the Membrany Interbranch Scientific Technical Complex participated in the work of the meeting of the aktiv.

7807

Role of Novosibirsk Obkom in Restructuring of Production

18140237 Moscow *EKONOMICHESKAYA GAZETA* in Russian No 31, Jul 87 p 4

[Interview with First Secretary of the Novosibirsk Oblast Committee of the CPSU A.P. Filatov by *EKONOMICHESKAYA GAZETA* corresponding N. Manuylov under the rubric "The Party Committee and Restructuring": "Create an Atmosphere of Searching"; date not given; first two paragraphs are *EKONOMICHESKAYA GAZETA* introduction]

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[Question] The fundamental principles of the restructuring of the management of the economy were formulated and adopted at the June (1987) CPSU Central Committee Plenum. One of the main tasks is to create such conditions at the works so that it would be receptive to innovations. How do you evaluate in this connection the significance of the applied science conference which was held in Novosibirsk?

[Answer] The oblast party organization needed to analyze the experience of party influence on the speeding up of the introduction of scientific developments in practice. In what does the criterion of the efficiency of such influence consist? How, by what techniques and methods is one to create, maintain, and develop in labor collectives an atmosphere of creativity, searching, and all-round interest in the acceleration of scientific and technical progress and socioeconomic updating? How in practice is one to put an end to formalism and red tape, the proliferation of paper work and ostentation, and bureaucracy which stifles initiative?

A clear answer was given to these questions: it is necessary to give freedom to creative scientific and technical work and to increase its transforming influence on

production. But it is impossible to do this without the extensive participation in restructuring of the largest possible number of scientists, specialists, and leaders and innovators of production. We do not have a shortage of capable and talented people. In all 14,000 scientific associates are engaged in the search for new technical solutions. Among them are 60 academicians, 600 doctors of sciences, and 6,000 candidates of sciences. While in all 80,000 people work in the sphere of science, including laboratories and pilot works. They have to their credit many important developments, which have literally transformed entire works. Take if only the introduction of radiation, plasma, and pulse (the explosion working of materials) technologies, which were developed by scientists of the institutes of nuclear physics, hydrodynamics, and thermal physics of the Siberian Department of the USSR Academy of Sciences.

[Question] The oblast party committee, as is known, is responsible for the political and socioeconomic situation in the oblast. Could you tell in greater detail about precisely how it is possible to aim in the necessary direction the activity of a quite large army of scientists and specialists?

[Answer] In order to link this enormous scientific potential more firmly with production and to focus it on especially promising directions of research, it was necessary to find an effective form of the organization of the activity of scientists and specialists of enterprises, which would speed up the passage of developments into practice. Thus there originated the idea of establishing under the oblast committee of the CPSU the council for scientific and technical progress. It received the status of a commission of the oblast party committee: of the 40 leading scientists and specialists, who became members of it, more than half are members of the oblast committee. The council became the coordinator of the formulation and implementation of the most significant scientific and technical measures and the solution of urgent national economic problems. There were established under it 13 sections, in which about 1,000 people are actively working. They encompass with their influence all the basic sectors and directions of the economic and social development of the oblast.

Further, the formulation and implementation of scientific and technical goal programs became the most effective organizational form of party participation in the strengthening of the contact of science and production. The councils are helping to overcome interdepartmental "patchwork," to combine better the sectorial and territorial principles of the management of the national economy, and to lend a goal orientation to the initiative of production and scientific collectives.

Let us take the program on the introduction of robots and the development of flexible production systems. The corresponding section of the council in a short time supplied plants and associations of the oblast with the necessary information and procedural materials, helped

to organize the delivery of 130 robots from the AvtoVAZ Association, and organized work on the promotion of the gained experience. All this played a very important role at the initial stage of the implementation of the program.

Yes, at first it was necessary to prompt labor collectives to introduce new technologies. The inertia of stagnation in the modernization of the production system proved to be too strong. And now it is making itself felt. Last year less than half of the industrial enterprises of the oblast produced products of the highest quality category, and their share in the total production volume is only a little more than 16 percent. Unfortunately, since the beginning of this year the desired change in the improvement of the consumer properties of products has also not occurred.

The work on programs of the acceleration of scientific and technical progress is only a part of the many-sided activity of the council. Applied science conferences, seminars, and exhibitions of new equipment are being organized under its aegis. Annually it holds jointly with the Novosibirsk City Committee of the CPSU "days of science," which are, on the one hand, a kind of account of scientists to workers and, on the other, an effective form of the promotion of scientific and technical achievements. Periodically the council publishes collections of developments, which have been completed by scientific organizations and are recommended for introduction at enterprises of the oblast. Similar councils under the supervision of the secretaries of the city and rayon party committees have been set up in all the cities and rayons of the oblast. The councils of the Zayeltsovskiy and Dzerzhinskiy Rayon Party Committees of Novosibirsk and the Berdsk City Committee of the CPSU are working most fruitfully.

[Question] But specifically how are the party committees of enterprises organizing this work?

[Answer] Wherever they seek, they find various forms. I would like to show this on the basis of the example of just one collective—the Sibelectrotyazhmash Production Association.

The implementation of the plans of the technical development of production, the development of models of new machines, and the assimilation of their series production is also being carried out here under the constant monitoring of the party committee and the party organizations of divisions and shops. The party committee is skillfully directing the work of the scientific research institute, which is a part of the association, is giving the utmost support to its initiatives in the matter of modernizing products, and is monitoring the assimilation in production of its scientific, technical, and design developments.

The results of the efforts of the party organization and the entire collective of Sibelectrotyazhmash find expression in the fact that 70 percent of its machines in their

technical and economic indicators conform to the highest world level. Moreover, they are being made of domestic materials and components.

For the purpose of ensuring the high technical level of products in the future the plant formulated a program of their updating with allowance made for world trends for 10-15 years and is actively cooperating with many sectorial scientific organizations of the Ministry of the Electrical Equipment Industry, as well as with academic institutes.

The fulfillment of the plans of cooperation with scientific organizations is constantly monitored by the party committee of the association. Support is always given to a useful initiative.

A similar approach distinguishes the party organizations of the Novosibirskiy priborostroitelnyy zavod, Vega, and a number of other production associations.

In our opinion, the practical experience of the work of the party organizations of several academic institutes on the strengthening of the creative ties with enterprises and on the introduction of new highly efficient technologies and cost accounting relations also merits attention.

In a speech at the 20th Komsomol Congress M.S. Gorbachev rated highly the work of the Start Temporary Scientific and Technical Collective, the first in the country, which is developing a fifth-generation supercomputer, about which *EKONOMICHESKAYA GAZETA* has told in detail.

[Question] And all the same: Do the party committees always succeed in ridding themselves in practice of formalism and of customary methods which do not yield the necessary impact?

[Answer] The objective results of management, the development of the social sphere, and retooling do not provide grounds for complacency, moreover, they arouse well-founded alarm. And frequently the cause of many failures and omissions lies precisely in the imperfection of party supervision of the national economic complex of the oblast, especially in the sphere of scientific and technical progress.

To a significant extent this is explained by the fact that not all party committees have today an effective mechanism of influencing the solution of the problems of scientific and technical progress, quite often difficulties arise for them in determining their functions, goals, and tasks and the specific methods of work. Formally made reports of specialists, lectures, and seminars frequently predominate. In other words, the party committees in most instances take the beaten path. And for this reason they do not obtain the high end result which is needed under present conditions. It is necessary that more active methods would predominate in the arsenal of means of party influence on scientific and technical progress. It

must not be allowed that direct acquaintance with the latest scientific and technical achievements would slip from the budget of time of specialists, shop chiefs, foremen, and brigade leaders. It is necessary to think about how to stimulate the activity of specialists in this direction and to induce them to study systematically the technical and technological innovations, which are appearing both at domestic enterprises and organizations and abroad. A competent, professionally knowledgeable specialist cannot exist without precise knowledge of the trends of development of science and technology in the corresponding sectors.

[Question] Party committees, thus, should delve more deeply into the area, which has not yet been mastered by them, of creative technical work, which thus far has been the prerogative of scientists, specialists, and innovators. To what extent have they been able to succeed in this new role for them?

[Answer] A study, which was made by the scientific research institute of the Academy of Social Sciences attached to the CPSU Central Committee and the Novosibirsk Higher Party School, testifies that the content and direction of the work of many party organizations still do not completely conform to the needs of production intensification and are not contributing in full to the restructuring of party life.

The analysis of party work at a number of surveyed enterprises shows that questions of scientific and technical progress are discussed in general formulation. The decisions on them are of an insufficiently specific nature. Many of the most important directions of the acceleration of scientific and technical progress are being ignored by party committees, they are also rarely encountered on the agenda of meetings.

A survey of management personnel of enterprises showed that only from 10 to 25 percent of them consider the orientation of the various elements of party work toward the acceleration of scientific and technical progress to be in keeping with the times. More than 90 percent of the surveyed party workers noted that their party committees as before are attaching the greatest importance to quantitative indicators and that they are still underestimating the indicators which characterize the processes of the intensification of production and the increase of its efficiency.

Nearly two-thirds of the engineering and technical personnel do not see a substantial restructuring of party work and an increase of its influence on the technical development of production. Only 1 percent of the scientists believe that the restructuring of party work is proceeding successfully.

The absolute majority of the surveyed elected party aktiv (66-80 percent on various questions) admitted that the party committees and organizations are attaching the minimum significance to the increase of the technical

level of production, the development and assimilation of new products and new technologies, the increase of the output-capital ratio, the increase of the skills of workers, and other problems of the intensification of production. Only 3 percent of the ideological aktiv, who participated in the survey, is satisfied with the work of party organizations on the technical development of production.

There is something here to think about, including a substantial adjustment in the style of work of party committees and the practice of interrelations between departments in the city party committees and the oblast party committee. For the present many people still believe as before that the acceleration of scientific and technical progress is the duty of only the science departments of party committees.

In the many-sided work on the acceleration of scientific and technical progress there are many still unsolved organizational and methodological problems, which directly concern the style and methods of party work. The success of restructuring, it was stated at the June CPSU Central Committee Plenum, depends on the efficient organization and party political support of the improvement of the management of the national economy and the acceleration of scientific and technical progress. The solution of these problems, which are unusual in nature and difficulty, also makes it incumbent to seek nonstandard approaches.

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7807

Readers Ask About Information, New Wage System

Search for Information

1814035 Moscow NTR: PROBLEMY I RESHENIYA
in Russian No 6, 17 Mar-6 Apr 87 p 8

[Article by A. Yezhova under the rubric "Page 8. Letters to the Editors": "Who Will Help?"; first paragraph is NTR: PROBLEMY I RESHENIYA introduction]

[Text] A letter from Groznyy has arrived at the editorial office. Our reader turns with emotion and demandingly for assistance:

"It is quite possible that the problem, over which our plant is sweating, has already been solved somewhere. But where? How is one to find the address of specific experience, of an organization which is capable of accomplishing a specific task? Our plant has turned to various scientific and technical information centers and sectorial institutes with a clean question, but in response they have received either complete disinterest in the accomplishment of the posed task or 'not what is wanted in principle'....

"To whom and in what form should one turn to get a satisfactory answer? Who should formulated technological problems and how?

"[Signed] V. Lisovoy, process engineer of the Krasnyy Molot Plant

"Groznyy."

The answer is clear—a bank of technologies is needed. We have already written about the initiative of establishing the All-Union Information Bank of Technologies (NTR, No 1, 1985). The conversation about the tasks and possibilities at that time was with V.N. Dmitriyev, an adviser of the State Committee for Science and Technology, and B.S. Perminov, chief of a department of the All-Union Scientific Research Institute of Organization and Management Problems (VNIPOU). Apparently, much has been done in the time that has passed since the publication....

We turn to the participants in the previous conversation. And what they reported to us perplexed us.

As it turned out, several months ago the VNIPOU was reorganized, and B.S. Perminov became the leader of the newly established All-Union Scientific Research Institute of Economic Problems of the Development of Science and Technology (VNIIEPRANT). Nevertheless, Boris Sergeyevich was not able to give an exhaustive answer to our question. For the most part the conversation revolved around the newly established institute, and

the impression was left that although the field of activity of its staff members has broadened, their specific creative interests are somewhat apart from the problems of the bank of technologies.

So what all the same has already been done and what are the difficulties? We went with this question of the Intersectorial Technologies Department of the State Committee for Science and Technology, of which V.N. Dmitriyev has become chief.

"A bank of information, which will help to evaluate the technical and economic significance of technologies not only today, but also 5, 10, and 15 years ahead, was contemplated," Vladimir Nikolayevich said. "That is, not simply an information file, but the evaluation of what has already been done or has merely been contemplated. Moreover, we are devoting particular attention to intersectorial technologies, since they have a broader field of application."

"The establishment of such a bank is an entirely new matter, and its implementation proceeded step by step. Source data were needed: how much raw materials, equipment, and products cost. Coordination between sectors over the entire chain to the final product was required. We cooperated with the State Committee for Standards, which developed the method of certifying technological processes. Another document was prepared with the participation of the VNIPOU—the development of methods of calculations with the use of computers."

At the VNIPOU there was a sector, which developed methods and made calculations. For this work the State Committee for Science and Technology acquired computers and turned them over to it. A collective of like-minded people, which treated the new matter with enthusiasm, was formed there.

But events, which froze the work, began here. With the establishment of the Committee for Computer Technology the VNIPOU was divided into two institutes. And the VNIIEPRANT, to which this theme was transferred, as if lost interest in it. Now the sector has been disbanded, competition has been set, and people are leaving.

But an unquestionable important and necessary matter was contemplated, and the position of economists is simply incomprehensible.

New Wage System

18140235 Moscow NTR: PROBLEMY I RESHENIYA
in Russian No 6, 17 Mar-6 Apr 87 p 8

[Article by L. Petrenko, chief of the Legal Department of the Administration of Affairs of the USSR Academy of Sciences, under the rubric "Page 8. Letters to the Editor": "Increments According to Labor"]

[Text] "The procedure of changing over to the new system of the remuneration of the labor of scientists interests me, just as many other associates of our scientific research institute. I would also like to find out: What

rights do they have in the area of the increase or decrease of salaries?

"[Signed] I. Tsyrlnikov

"Leningrad."

The new conditions of the remuneration of the labor of scientists, designers, and process engineers of scientific research institutions, design and technological organizations, production and scientific production associations, and enterprises of industry, as well as scientists, designers, and process engineers of scientific research institutions and design and technological organizations of the USSR Academy of Sciences and the academies of sciences of the union republics were introduced by Decree No 462 of the CPSU Central Committee, the USSR Council of Ministers, and the All-Union Central Council of Trade Unions of 22 May 1985, "On the Improvement of the Remuneration of the Labor of Scientists, Designers, and Process Engineers of Industry." This decree also applies to the workers of scientific research institutes and design bureaus (which are on an independent balance sheet) attached to higher educational institutions of the system of the USSR Ministry of Higher and Secondary Specialized Education, as well as the scientific research parts of these educational institutions.

For the scientific research institutes of industry, the USSR Academy of Sciences, and the academies of sciences of the union republics two categories in the remuneration of labor are envisaged instead of three. A new schedule of their salaries is also being introduced. Instead of the previously existing three positions of scientists five are being established: chief scientific association (doctor of sciences), leading scientific associate (doctor or candidate of sciences), senior scientific associate, scientific associate, and junior scientific associate. The differentiation of their salaries subject to the results of work is envisaged.

For the strengthening of the connection of the remuneration of the labor of scientists, designers, and process engineers with their personal contribution to the acceleration of scientific and technical progress it is permitted to establish by means of the saving of the wage fund increments for scientists, designers, and process engineers for the fulfillment of the most difficult and responsible jobs in the amount of up to 50 percent of the salary and for other highly skilled engineering and technical personnel, specialists, and employees—up to 30 percent of the salary for the period of the planned time of the fulfillment of the jobs or for another period. The indicated increments are eliminated or reduced in case of the failure to meet the deadlines of the completion of the job or its individual stages, its unsatisfactory quality, as well as in case of the violation of labor and production discipline. The right has been granted to change (increase or reduce) the salaries of the indicated personnel in accordance with the results of certification within the limits of the maximum and minimum amounts for the

corresponding position regardless of the average salaries of the salary schedules, which are in effect at these associations, enterprises, and organizations. The salary can also be increased in case of the high quality and timeliness of the jobs being performed prior to the conducting of the next certification.

In case of the awarding of academic degree to scientists the right is granted to transfer them to a higher position or to increase their salaries by up to 50 rubles a month within the limits of the maximum salary for the held position, while for designers, process engineers, and other specialists in case of the awarding of an academic degree to increase the salaries in the amounts that are envisaged by prevailing legislation.

In case of the changeover to the conditions of the remuneration of labor, which are envisaged by the decree of the CPSU Central Committee, the USSR Council of Ministers, and the All-Union Central Council of Trade Unions of 22 May 1985, the salaries of managers and scientists of scientific research institutes of affiliates are established no lower than the salaries that are envisaged by Appendix No 3 of Decree No 660 of the USSR Council of Ministers of 5 June 1957 on the corresponding positions.

7807

Ivanovo-Sofia Scientific Production Association
18140218 Moscow KRASNAYA ZVEZDA in Russian
10 Jun 87 p 3

[Interview with Nenko Goranov, chairman of the Integrated Automation of Technological Processes Economic Trust, by NARODNA ARMIYA correspondent Captain Evgeni Genov, and with Vladimir Valentynovich Pavlychev, chief of the Economic Planning Department of the Machine Tool Building Production Association, by KRASNAYA ZVEZDA correspondent Captain Second Rank V. Kocherov, under the rubric "Horizons of Integration"; "Ivanovo-Sofia"; date not given; first four paragraphs are KRASNAYA ZVEZDA introduction]

[Text] "Dear editorial board!

"In recent times much has been said and written about direct ties between enterprises of the USSR and the other socialist countries, while recently in a broadcast over Central Television they told about the Ivanovo-Sofia International Scientific Production Association. However, both in newspaper publications and in television programs on this association it is more a question of special problems, behind which it is difficult to discern the main thing: What is the need of the country for the machining centers, which are being produced today in our country and in Bulgaria, and how is it being met?"

"[Signed] A. Lebedev, participant in the Great Patriotic War"

In accordance with a mutual understanding KRASNAYA ZVEZDA and the central organ of the Bulgarian Ministry of National Defense, NARODNA ARMIYA, sent correspondents to the corresponding enterprises of the international association in Ivanovo and Sofia in order to answer these questions.

On the Right Path

Captain Evgeni Genov, correspondent of the newspaper NARODNA ARMIYA, interviews Nenko Goranov, chairman of the Integrated Automation of Technological Processes Economic Trust.

[Question] Tell me, please, what advantages of an economic and technical nature are coming to light for us owing to cooperation with the Soviet side?

[Answer] The economic advantages are indisputable. They consist in the efficient use of production capacities, the decrease of energy and material expenditures, the increase of labor productivity and product quality, and the expansion of sales markets. More specific indicators of such advantages also already exist. The plan of last year was fulfilled by 111.2 percent. In all 40 machining centers were produced in addition to the plan.

The division of labor in the area of research work and the designing of flexible automated machine systems (GAPS's) is also creating advantages of a technological nature. These are the shortening of the time of the technical preparation of production, the rapid change of its structure, the increase of the series production of specialized products....

The production program for the period of 1986-1990, which was agreed on beforehand, envisages the production of 2,526 machining centers. Bulgaria accounts for 500 units, the Soviet Union—2,026. Moreover, 174 turning centers (we will produce 100 of them), components, items, and units of 17 types, 2,960 control systems, and 4,470 programmable controllers will be produced during the current five-year plan.

[Question] Evidently, difficulties in the accomplishment of our common tasks also exist.

[Answer] Of course. One of them is connected with the differences in the starting points when forming the prices for parts and assemblies, which are produced in both countries. It is well known that materials and raw materials in the USSR are significantly less expensive than here. Moreover, a difference in the labor productivity of the workers, who are engaged in industrial production, also exists, which affects the organization of the labor of each of the partners. A vital requirement of the day is the establishment of enterprises with common property. We and our Soviet partners are ready for work at such an enterprise, but specialists have still not been able to come to a common definition of "common socialist property"....

[Question] How do you intend to solve arising problems jointly with Soviet machine tool builders? How are you using their know-how?

[Answer] The introduction of Soviet advanced know-how was one of the basic tasks during the past period. With the aid of Soviet partners we commenced the efficient use of NC machines, as well as the application of effective methods in foundry work. Joint activity is speeding up significantly the designing-introduction cycle. With the aid of Soviet specialists we succeeded for the first time in selling on the Soviet market 68 machining centers of our own design. As a whole the analysis of our work during the 1st quarter of this year shows that the agreed on tasks are being fulfilled on the planned dates.

In Favor of Partnership

Captain Second Rank V. Kocherov, correspondent of the newspaper KRASNAYA ZVEZDA, met in Ivanovo with V. Pavlychev, chief of the Economic Planning Department of the Machine Tool Building Production Association.

[Question] Vladimir Valentinovich, how do you explain that precisely Bulgarian machine tool builders became your partners in the international association?

[Answer] Honestly speaking, we did not choose partners for ourselves. It is rather they who chose us. A little more than 2 years ago the fellow student at the institute of our general director, Vladimir Pavlovich Kabaidze—plenipotentiary minister and counselor of the embassy of Bulgaria in Moscow, I.S. Kharlampiev—suggested to him the idea of establishing such an association. The suggestion was in the spirit of the times. For both we and the Bulgarian machine tool builders are equally interested in the more complete and high-quality meeting of the needs of the national economy for modern equipment, namely machining centers, which blend well with flexible machine systems, which, as is known, have a future. Incidentally, they already have a present as well. The present needs of industry testify to this. For the present we are still not capable of fully meeting them, although in recent times we have increased somewhat the production volume.

The dynamics of recent years here is as follows: in 1984—243 machining centers, in 1985—277, in 1986—330. Tenfold more are needed! In this connection by the end of the five-year plan we together with other enterprises of the ministry should increase the output of machining centers to 9,000 a year.

[Question] And what is the main problem in this direction?

[Answer] The improvement of the organization and cooperation of production so that by 1990 our association would begin to produce annually more than

900 machining centers. I repeat, this is the main problem which we have to solve, since it is connected with the retooling of the machine pool of enterprises of the country and its supply with the most advanced means of production, as the 27th CPSU Congress requires.

[Question] And how in this case will the problem of product quality and the decrease of the product cost be solved?

[Answer] Today we still have to purchase for currency in capitalist countries a number of components for machining centers. In the future by means of several types of components, which have been produced by Bulgarian colleagues and have successfully undergone tests (they will be used in the production of the IR-200, IS-500, and IS-800 machining centers and other machine tools), these purchases will be reduced by approximately 40 percent.

The introduction in practice of the achievements of joint scientific and technical thought will undoubtedly also have an effect on the decrease of the product cost and the increase of product quality. Recently, for example, Bulgarian specialists conveyed to us the know-how of the efficient use of a laser complex for the cutting, hardening, and welding of metals. We, in turn, helped our Bulgarian friends in the organization of work on the retooling of casting shops and in the organization of work at NC machine tools.

The constant exchange of the fruits of scientific research and planning and design work enabled us to begin a year ahead of time the production of the IR-200 and IRT-180 machining centers (a turning center and a minicenter) and 2 years ahead of time the IS-500 and IS-800 machining centers and the IPL-1600 laser machining centers, of which there is no analog in the world. Incidentally, about the quality and competitive ability of our machine tools. This year we will deliver up to 20 machining centers to the world market, including to such countries as Japan, the FRG, Italy, France, and Finland. This, I believe, is a weighty argument in favor of our cooperation.

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Factors Behind Aging of Belorussian Science 18140219 Minsk SOVETSKAYA BELORUSSIYA in Russian 7 Jul 87 p 2

[Article by V. Bibikov under the rubric "Problems and Opinions": "Is It Easy to Be Young? Subjective Notes on Why Belorussian Science 'Is Growing Old'"]

[Text] Albert Einstein was only 26 when he published his main works. Lev Landau as a 19 year old youth proposed the famous density matrix. His eminent fellow countryman, three-time Hero of Socialist Labor Yakov Borisovich Zeldovich became a candidate of sciences at 22 and a doctor of sciences at 25. Not yet having reached 30,

Academician of the Belorussian SSR Academy of Sciences V.P. Platonov drew his basic scientific conclusions, which are known today to specialists of the entire world.

Unfortunately, "super new stars" are appearing more and more rarely on the scientific horizon of our country and republic. And where is one to get them, if the bulk of researchers of high and the highest skills (and it is possible and necessary to expect precisely from them breakthroughs into the unknown) are at the age when brilliant insight, alas, will hardly visit them owing to entirely natural physiological laws. Why has science "grown old"? And what is it necessary to do in order to return youth to it? In search of answers to these questions I set out for the Belorussian Academy of Sciences. Basic theories, which govern the development of science and technology as a whole, should originate precisely here. Processes, which are typical of all Belorussian science, are occurring most obviously in this largest research collective in the republic.

The Rule of the Gardener

A good gardener does not wait until some trees or others in his orchard, having grown old, begin to decrease the yield and droop. His concern is to prepare in good time their replacement with young nursery trees, often of the latest selection, with greater potentials. And to restore the orchard.

The enormous labor collective, which the Belorussian SSR Academy of Sciences is, of course, is not an orchard, and people are not trees. Nevertheless, here it also does no harm to observe "the rule of the gardener." It would not hurt to remind the executives, who due to age or for other reasons are not capable of performing the role of the leader of a scientific subdivision, of the moral duty to give up the held position. On the other hand, one should be concerned in every way about the creative growth of talented young people.

Alas, the opinion is forming that at some stage the Presidium and the public organizations of the Academy of Sciences consigned both these tasks to oblivion. Just 15 years ago the executives of scientific subdivisions, who were not yet 40, made up in their category nearly a third. Now of the 371 chiefs of laboratories, sectors, and departments only 18 are not over 40, but then 239 executives are 51 years old and older, including 65 (1 in 6!) who are of retirement age.

The other strata of researchers are also not noted for youth and, hence, promise. For example, at the institutes of the Physical and Technical Problems Department the average age of junior scientific associates is equal to or greater than 35, senior scientific associates—45, leading and chief associates—50. If this trend is not broken, in the next few years the personnel problem will become the most urgent one at the Belorussian Academy of Sciences.

Why Has the "Soil" Become Poor?

I foresee an objection of the "old men": We will leave, but whom will you put in our place? The question is not idle, for, alas, often there is no choice. Of the more than 2,000 candidates of sciences, who work at the Belorussian Academy of Sciences, only 192 have not reached the age of 33, there is not one so young a doctor of sciences among the 230. And at the age of up to 40 it is possible to count them on the fingers of one hand. But you will really not entrust a scientific laboratory to a middle-level specialist.

A typical situation in this sense has formed at the Institute of Applied Physics of the Belorussian SSR Academy of Sciences (however paradoxical, the youngest one at the academy). The majority of chiefs of its laboratories have passed the boundary of retirement, while the average age of this stratum of managers comes to 54. There are only 5 doctors of sciences for the 144 scientific associates of the institute, moreover, the majority of them have left the threshold of 60 behind. In short, the personnel problem in reality is already being placed here in the forefront, this requires urgent steps on the increase of the skills of talented young workers, of whom, in principle, there are quite a few at the institute.

"On the average too much time—about 10 years—is being spent on acquiring a candidate degree," Doctor of Physical Mathematical Sciences N.A. Fomen, chairman of the Council of Young Scientists and Specialists attached to the Central Committee of Komsomol of Belorussia, reveals the causes of the slow professional growth of researchers. "Frequently they entrust a young specialist with a special, purely technical job which does not give freedom for creativity. While the manager of the scientific subdivision pretends that there is nothing special in this. A year or 2 pass and the young person either loses any hope of expressing his opinion in science and, along with it, initiative or leaves for production. It is a blessing, the wage there is also more significant."

Add to this the purely everyday inconveniences, with which the young person, who has decided to devote himself to science, is faced. For example, if he did not have a Minsk residence permit, they did not assign him to the academy, since there until recently there was no free space in the dormitory and housing, consequently, they did not provide it. One worker in 10 of the academy needs the improvement of housing conditions, but in order to obtain an apartment, it is necessary to wait 10-12 years. About 800 people are standing in line to get their children a place at a kindergarten or nursery. Only a fourth of all those who want to can send their children to a Pioneer camp. The medical and public health section and the base for sports and health improvement work are weak.

In short, it is necessary to be truly immensely in love with science in order to ignore all this. Many capable graduates of higher educational institutions, having

weighed all the "pros" and "cons," wend their way to industrial enterprises, where social problems are being solved significantly better. The statistics testify: among young people of the republic scientific associates make up only 0.2 percent, which is disproportionately few and testifies to the decline of the prestige of scientists.

Incidentally, are only "objective" causes of the material and everyday level to blame for the fact that the "soil," which supplies the Belorussian Academy with gifted people, has become poor? Let us look more closely at our system of higher education, which should train for scientific institutions additional staff who do not think along standard lines. For quite recently entirely official indicators oriented higher educational institutions toward the "gross": in grades—a little higher, in the graduation of specialists—a few more. Even the scientific research work of students was evaluated "according to the coverage" in percent, and not according to the results. And this procedure, although already condemned, has not been eliminated, since it is not that easy to do this.

It is paradoxical, but they have actually removed from the training of future scientists...scientists themselves. Whoever studied in the 1950's and 1960's, for example, at the Belorussian State University, probably remembers that leading researchers of the academy often gave lectures to students. Suffice it to mention the names of Yerugin, Stepanov, Yelyashevich, and Suprunenko. But then they placed on this glorious tradition, which is rooted in the ancient history of Russian and world science, a... "taboo": they prohibited working with students during working time. As a result from 1980 to 1986 the number of staff members of the Belorussian SSR Academy of Sciences, who gave lectures at the Belorussian State University for payment by the hour, decreased from 103 to 57.

But now a higher education diploma has been received. However, for the scientist the higher educational institution is only the start. The second stage is graduate studies. How is this opportunity to train in advance "elite planting stock" being used at the Belorussian SSR Academy of Sciences? The plans of enrollment in graduate studies are regularly exceeded. The return from them leaves much to be desired. Of the nearly 2,000 people, who completed graduate studies in the past 10 years, 1,157 never defended candidate dissertations. Only one graduate student in eight did this in the suggested 3-4 years. It is necessary to add to this that the dropout rate of students, including due to poor progress, is very high.

What is the matter? First of all, there is no one to choose from. Strange as it may be, today there is practically no competition in case of enrollment in graduate studies. Not everyone will decide at the age of 25-30 to live on a stipend of 85-100 rubles. They are taking, to put it mildly, people who are not always the most capable, but

are supported by a reliable parental "rear." The middle person has flocked into science. Vice President of the Belorussian SSR Academy of Sciences I.Ya. Naumenko stated at a republic conference of social scientists. I have had occasion to hear such an opinion from many prominent scientists.

Are proofs necessary? Here is one of them. From year to year up to half of the people enrolled in graduate studies do not take one candidate examination, while the proportion of those who have taken three examinations come to only 8-14 percent. It turns out that in 1986, for example, of the nearly 200 people, who completed graduate studies, only 6 defended a dissertation on time.

Strange as it may be, up to now the corresponding subdivisions of the institutes and Presidium of the Belorussian SSR Academy of Sciences and scientific supervisors have not borne real responsibility for the poor quality training of graduate students. The acquisition of the proper scientific skills is as if the personal affair of those who have enrolled in graduate studies. Although it is easy to be convinced of the opposite, if you add up if only the stipend which has been spent in vain on their training. By what, if not the minimized accountability for the training of personnel, is one also to explain the fact that our academy holds the next to last place among the academies of the union republics in the proportion of candidates of sciences?

It is also possible to say the same thing about doctors of sciences—specialists of the highest scientific skills. And from where are they to come, if of the 244 staff members of the academy, who in the past 6 years have committed themselves to submit doctoral dissertations for defense, only 179 did this, while only 130 defended them? What is getting in the way of the writing of works? I ask Candidate of Technical Sciences V.A. Konev, chief of a laboratory of the Institute of Applied Physics of the Belorussian SSR Academy of Sciences, about this. He is, of course, a creative person. Six of his students have become candidates of sciences. But he himself, alas, has not yet gotten to the next "level."

"The ignorance of the route that should be negotiated is embarrassing," Vladimir Afanasyevich replies frankly. "For we do not have a specialized council, in which it would be possible to attend the defense of doctoral dissertations. Meanwhile one would like to provide a margin of safety, but this requires additional efforts and time. Perhaps, doctoral studies would significantly speed up the preparation of such works."

I believe that it is a matter not only of this. It is obvious that a taste for such an important matter as the obtaining of the highest scientific skills is simply absent both at the Institute of Applied Physics and at the majority of other institutes of the academy. The fact that just recently among some functionaries of science a respectable age,

obviously, was associated with a respectability of knowledge, also contributed to this. Is that not why the average age of scientists, who defended doctoral dissertations in 1981-1985, gravitates toward 50?

The essence of the matter, however, lies not only in the number of doctoral diplomas. It is far more important that their shortage testifies to the priority of applied research to the detriment of basic research, which was artificially created in past years. For the doctoral dissertation is also called upon to consolidate the fundamentally new results precisely in this sphere.

"The fact that for a long time the economic impact from the introduction of developments was one of the most important plan indicators, which were established for the academy, had an effect," Vice President of the Belorussian SSR Academy of Sciences A.V. Stepanenko believes. "For some institutes economic contracts with industry accounted for up to 70 percent of the financing. But it, of course, pays first of all for what will yield a rapid and guaranteed impact. Moreover, minor themes are always introduced more easily and rapidly. Such works, of course, cannot provide profound results which are worthy of a doctoral degree."

But the main task of the Academy of Sciences lies in obtaining basic knowledge.

But the Orchard Shall Blossom!

In short, the lack of strong scientific shoots is a consequence of the general stagnation which struck our society at a specific stage of development. Reliance on the gross, on an indicator, which is far from life, ostentation, and the discrepancy between word and deed, alas, also played a mean trick on science. However, during the times that were most unfavorable in this sense a considerable number of scientists understood that without an invigorating influx of fresh forces the future of science is very problematic and that is why the ties of a number of institutes of the Belorussian SSR Academy of Sciences, for example, with the Physics Faculty of the Belorussian State University were not broken. Precisely there the passing of the baton of scientific research is occurring from hand to hand (or from head to head?).

"I would like to enlist scientists of the academy more extensively in pedagogical activity," Dean of the Physics Faculty V.A. Gaysenok says. "We have concluded a contract on cooperation in the matter of training personnel with one of the departments of the Belorussian SSR Academy of Sciences. Our affiliates, at which undergraduates are studying, are operating at four institutes of the academy. Starting with the next school years new stimuli to participate actively in the training of specialists will appear for scientists. The hourly pay for work with them is being increased by approximately threefold, it is now permitted to confer the titles of docent and professor on a person paid by the hour.

Important changes have occurred in the management echelon of the Belorussian SSR Academy of Sciences. The president (the new one, incidentally, is the youngest among the presidents of the republic academies of sciences), two vice presidents, the chief scientific secretary, and the academician secretaries of the two most important departments have been reelected. Will they be able to break the tendency for the research corps to grow older? An entire series of decrees, which were adopted in March of this year by the CPSU Central Committee, the USSR Council of Ministers, the All-Union Central Council of Trade Unions, and the All-Union Komsomol Central Committee, affords considerable opportunities for this.

While interviewing executives of the academy, I found out that a number of measures on the rejuvenation of scientific personnel have been planned. Judging from them, the prospect is tempting. However, in former times one also had occasion to hear many fine words, but meanwhile the matter did not change for the better. Now, consequently, the main task is to implement persistently what has been outlined. Let us take the same certification. It is no secret that it was carried out formally at the Belorussian SSR Academy of Sciences, less than 1 percent of the staff members were not certified, the wage was reduced for the same number, and the total number was reduced by only 115, mainly due to the decrease of...vacancies. Will not such a thing also recur in the future?

The problem with the registration of people from other cities has not been completely eliminated. The fulfillment of many points of the housing program is problematic. There is no realistic prospect with the construction of kindergartens, but no less than two of them are needed. It is possible to say the same thing about the sports and health improvement complex (the decision on its construction was made for the first time 10 years ago). It is not clear by means of what funds the 5-percent young additional staff is to be hired at the academy and advisors are to be paid.

But the main thing is that reform in the minds and hearts of the very workers of the academy and, first of all, the communists has to be achieved. For it is a fact that the improper behavior of several former managerial workers of the Belorussian SSR Academy of Sciences at one time never received proper party appraisal within the academy. Does not the chain of too low demands on oneself and colleagues, which extended both through the certification of scientists and through the activity of graduate studies, begin here? The events at the Institute of Nuclear Power Engineering, where the party organization recently expressed lack of confidence in its party bureau, testify that demandingness on "old" personnel, who have permitted, to put it mildly, incompetence in work, as before is lacking.

I am speaking about this because it is possible to train on the basis of similar principles a generation of scientists, which will differ from the past generation only in age.

But the point is, after all, to arouse initiative and a thirst to seek scientific truth. It is possible to see to it that precisely such people would "be developed," only in case of the more extensive participation of rank and file researchers in the management of scientific subdivisions and institutes, including the remuneration of labor and promotion, foreign business trips, and so on. Unfortunately, for the present the winds of the times have lightly touched this sphere. So far an election to one management position or another has not been held at the Belorussian SSR Academy of Sciences, although the need for this is unquestionable.

In short, not only the scientific research staff of the academy, but also many aspects of the scientific and public life of the largest research collective need rejuvenation. It is necessary to reform them on the basis of democratization, so that in the future when evaluating any worker his real contribution to the common cause, and not someone's likings or dislikes, past services, or else simply loud declarations would be taken into account first of all. Then the problem of "aging" will be solved, as they say, by itself.

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Annual General Assembly of Uzbek Academy of Sciences

18140229 Tashkent PRAVDA VOSTOKA in Russian
8 Apr 87 p 1

[Article (UZTAG): "The Goals of Restructuring Are Intensification and Efficiency. From the Annual Assembly of the Uzbek SSR Academy of Sciences"]

[Text] The Annual General Assembly of the Uzbek SSR Academy of Sciences was held in Tashkent on 7 April. At it the tasks of scientific collectives, which follow from the concept of acceleration, which was advanced by the party, the requirements of intensification, and the increase of the contribution of science to the economic and social development of the republic, were discussed in detail.

President of the Uzbek SSR Academy of Sciences and Corresponding Member of the USSR Academy of Sciences P.K. Khabibullayev opened the assembly with an opening address. The reports of Academicians of the republic Academy of Sciences T.R. Rashidov and E.Yu. Yusupov, vice presidents of the Uzbek SSR Academy of Sciences, and Academician of the republic Academy of Sciences M. Muzafarov, academician secretary of the Biological Sciences Department of the Uzbek SSR Academy of Sciences, on the basic results of the development of science in 1986 and the tasks of the Uzbek SSR Academy of Sciences for 1987 and of Academician of the Uzbek SSR Academy of Sciences D.A. Musayev, chief scientific secretary of the presidium of the academy, on the work of the Presidium of the republic Academy of Sciences during the period under review and the plan of scientific research work for 1987 were heard.

It was noted in the reports and speeches that the large-scale and difficult tasks, which have been set today for science by the party and restructuring, also require a radical turn toward work in the new way in all the units of the republic Academy of Sciences. The basic directions of scientific research were clearly specified in the decisions of the 27th CPSU Congress. The cardinal acceleration of scientific and technical progress and the extensive introduction of equipment of new generations and fundamentally new technologies, which ensure the highest productivity and efficiency, are the main lever of intensification. These tasks were specified in the decisions of the January (1987) CPSU Central Committee Plenum, which once again stressed the necessity of transforming science into a truly powerful productive force.

The main criterion of the efficiency of the labor of scientists, it was stated at the assembly, is the benefit it brings to society. Such fundamental scientific results, which would become an essential factor of intensive development in industry, construction, agriculture, and the social and spiritual sphere, are needed. The process of restructuring, which has begun at the republic Academy of Sciences, should be oriented precisely toward this.

Now in the system of the academy about 60 scientific subdivisions are operating and a detachment of many thousands of scientists work. It was noted that the principled, constructive criticism, which was heard at the 21st Congress of the Communist Party of Uzbekistan and at the plenums of the Central Committee of the Communist Party, clearly benefited the cause and that the activity of scientific collectives has been stepped up noticeably in recent times, which made it possible to achieve a number of quite good results during the past year. This pertains to new radiation-resistant materials and to the radioimmunological method of identifying patients suffering from hepatitis—an urgent problem for Uzbekistan. A license for a device for processing superhard and ductile materials, which was developed by Uzbek scientists, was purchased abroad.

At the same time, the assembly participants noted, science in the republic has not yet become a truly effective productive force and a genuine catalyst of scientific and technical progress. The mighty scientific potential, which was created during the years of Soviet power, is being used far from completely. Our scientific institutions in practice have not been put into operation in the interbranch scientific technical complexes, which have been set up in the country, and are poorly participating in international scientific programs. In the last 10 years scientific institutions in the republic have made no discoveries and very few proposals for the registration of licenses. The quality of the developments, which have been completed by scientists of Uzbekistan at the level of inventions, is below the average union level, and the number is altogether unsatisfactory—on the average there are only 3 inventions a year per 100 scientists. The

academic institutes of Uzbekistan have not become the main institutions for any of the 18 regional socioeconomic, scientific, and technical programs which were approved for the present five-year plan.

These shortcomings and omissions, the speakers emphasized, had also been pointed out previously, but effective measures were not taken to eliminate them. Meanwhile the times urgently require that the Academy of Sciences and all its subdivisions would participate in the most active manner in the search for the shortest possible route in the direction of the tasks, which the republic party organization and all the workers of Uzbekistan are working on in the drive for the increase of the efficiency of production and its intensification. But for this in republic science itself it is necessary to make radical qualitative changes and to see to it that its structure and the organization of work would conform to these tasks and the requirements of the day. Restructuring should in practice affect all the basic aspects of the activity of the academy: planning, the coordination of research, the material and technical base, and personnel policy.

It was noted at the assembly that the cardinal change of the status of its departments, the broadening of their rights, and the increase of their role and responsibility should become the basic unit of the restructuring of the activity of the Academy of Sciences. While the presidium of the academy must be able to see the main thing, to free itself from the settlement of secondary questions, and concentrate efforts in the main, strategic directions of the development of science in the republic. It is necessary to define its goals and tasks more specifically, on the basis of urgent requirements and the prospects of economic and social development, and to prepare detailed proposals. The matter, it was stressed at the assembly, is posed today as follows: all academic institutes must prove their right to exist and confirm it by genuine participation in all-union and republic programs.

The need for the improvement of the coordination of scientific research was named at the conference as one of the most important tasks of the republic headquarters of science. For the present the academy and its departments are not displaying proper initiative in this matter. Scientific problem councils for the most part exist formally and are not organizing fruitful cooperation with the higher educational institutions and sectorial scientific research institutes. Thus, only a little more than half of the higher educational institutions operating in the republic are encompassed by various forms of coordination, while the share of participation of sectorial scientific research institutes is even lower—27 out of 80. At the very same time the most significant results, as practical experience shows, are achieved precisely when the efforts of the various research collectives—academic, VUZ, sectorial, and production—are united.

Precisely such purposeful cooperation is especially needed today by the republic in vitally important, promising directions—in machine building and material science, the mechanization of technological processes,

genetic engineering, ecology, and sociology. The situation with the processing of the products of cotton growing was cited as an example. Scientists have proposed quite a number of methods for processing raw cotton and the stalks of cotton plants. However, there is no uniform approach in the recommendations, they are not oriented toward the achievement of the most effective overall result. It is high time for an integrated, systems approach in the planning and coordination of scientific research work—starting with its economic substantiation and ending with the development of specific, complete technologies, devices and flow lines, and enterprises.

But for this it is necessary to develop and consolidate new organizational forms of the integration of science and to strive for the large-scale embodiment of scientific ideas in the practical work of the national economy. This important question requires constant attention, especially as the speakers pointed out here quite a few shortcomings and omissions. Suffice it to say that the national economic return of science in the last 5 years has decreased to one-third, while the plan indicator on economic efficiency was fulfilled at the level of only 37 percent. Anxiety was expressed about the organization of work at the design bureaus, which should have become guides of scientific ideas and experimental developments into practice and should have assumed the basic responsibility for their introduction. This, however, is not happening. The design bureaus, which have a weak production base, work on their own assignments and perform minor tasks, which are of little significance for the republic and often are not connected with it at all.

At the same time experience shows that the reserves of the acceleration of scientific and technical process, it was stressed in the speeches, can be more fully realized in case of the uniting of the academic institutes with the corresponding design collectives and pilot works within unified scientific technical complex. In this connection the establishment in the republic of interbranch scientific technical centers for machinery for cotton growing and production machinery and solar power engineering deserves approval. The Academy of Sciences, ministries, and planning organs should constantly devote attention to such centers and associations, which are a promising form of the integration of science and production, and should help them to reveal more completely the possibilities incorporated in them.

Considerable space in the discussions was allotted to the questions of improving research and increasing the efficiency of the work of social scientists. It was stated that they need to delve more deeply into the phenomena and processes of contemporary life and to interpret and generalize them more comprehensively—from party positions, in light of the tasks on which the communists and all the people are working today. The importance of studies of the dialectics of the productive forces and

production relationships, innovative methods of management, democracy and self-government was emphasized. Philosophers and economists, historians and lawyers can and should make a more significant contribution to restructuring and acceleration.

In particular, the practice of making scientific forecasts requires improvement, which should become one of the most important tasks of the republic academy and all its subdivisions. First of all the formulation of the optimal structure of the development of the national economy of the republic for the long-term is needed. The comprehensive scientific substantiation of such a most urgent aspect as the efficient use of manpower resources is necessary. Practical, scientifically sound recommendations on the increase of the effectiveness of atheistic education, the broadening of international consciousness, the introduction of new traditions, and many most important questions of social and spiritual life are greatly needed.

The labor of a scientist is a continuous quest, which requires the maximum exertion of efforts. Only such people—inquisitive, restless people, who are constantly filled with creative daring—are capable of advancing science and achieving the greatest result in it.

In this connection the question of scientists was raised pointedly at the assembly. It was noted that this is not a new problem, but it is still far from solved, on the contrary, it is becoming more urgent year after year. At the Academy of Sciences there is not a single academician today less than 50 years old, while the average age of the doctors of sciences exceeds retirement age. At the same time the rejuvenation of science and the training of scientific replacements have been organized altogether unsatisfactorily. No one is properly dealing with this question either at in the institutes or at the academy itself. During the last five-year plan of the 350 graduate students only... 14 young scientists defended their candidate dissertations on time. However, this fact was not even given proper evaluation, it did not cause anyone alarm, although there is something to worry about here: at present not more than 5.0 percent of candidates of sciences working in the system of the academy are less than 33 years of age. The executives of the republic Academy of Sciences and its subdivisions, it was stated at the assembly, need to constantly check their personnel policy against life and its dynamics and to continuously improve the system of the political and professional growth of personnel and their moral and ethical education.

The role of primary party organizations in the improvement of personnel work was specially emphasized. There are more than 40 of them in the system of the republic Academy of Sciences. Precisely they are called upon to actively influence personnel policy, to spot in time people with an innovative flair, who are needed now in all sections, and to help such people become established in the leading units of academic institutions. Party

organizations cannot be indifferent to who is the head of a sector, a department, and an institute and should try to see to it that these sections would be entrusted to the most worthy people. Precisely the party organizations are called upon to develop a spirit of innovation and scientific purposefulness in collectives and to firmly establish an atmosphere of adherence to principles and intolerance of shortcomings, ostentation, and empty talk.

In the process of restructuring, the speakers said, it is important to reveal all the capabilities of the entire scientific collective, every scientist and manager, in order to use them with the maximum efficiency. There are no and can no longer be any inviolable people and zones closed to criticism—the principled policy of the party, which is aimed at stimulating initiative in every possible way and at developing democracy, openness, and creative competition, should become decisive everywhere. Only under these conditions is rapid scientific progress and a genuine increase of its role and influence on the acceleration of the economic and social development of the republic possible.

First Secretary of the Uzbek CP Central Committee I.B. Usmankhodzhayev also delivered a speech at the assembly.

The assembly participants approved the measures of the Uzbek SSR Academy of Sciences on the worthy greeting of the 70th anniversary of the Great October Socialist Revolution, as well as adopted the socialist obligations of the collectives of the scientific institutions and organizations of the republic Academy of Sciences for 1987.

I.A. Rozanov, chief of a sector of the CPSU Central Committee; B.F. Satin, first secretary of the Tashkent City Party Committee; and V.V. Sudarenkov, deputy chairman of the Uzbek SSR Council of Ministers, also participated in the work of the assembly.

9006

Session of General Assembly of Kazakh Academy of Sciences

18140227 Alma-Ata KAZAKHISTANSKAYA PRAVDA
in Russian 26 Apr 87 p 3

[Article (KAZTAG): "For a Drastic Change in Scientific Work. The Session of the General Assembly of the Kazakh SSR Academy of Sciences"]

As was already reported, the session of the General Assembly of the Kazakh SSR Academy of Sciences was held in Alma-Ata. In the reports of Academy President M.A. Aytkhozhin, Acting Chief Scientific Secretary I.Ye. Yerofeyev, and Vice President of the Republic Academy of Sciences Ye.V. Gvozdev and in the statements of Secretary of the Central Committee of the Communist Party of Kazakhstan Z.K. Kamalidenov and other session participants it was noted that the scientists, like all

the workers of Kazakhstan, fully approve of and support the Leninist policy of the party of restructuring and revolutionary changes, democratization, and the increase of the role of the human factor in all spheres of the life of Soviet society and are displaying greater and greater energy, initiative, and creative searching for the fulfillment of the decisions of the 27th party congress, the January (1987) CPSU Central Committee Plenum, and the 8th Plenum of the Central Committee of the Communist Party of Kazakhstan.

During the past year the republic academy made definite gains, which it is possible to regard as the first reassuring results of the process of modernization, which has begun in its activity. In all 244 developments, which were offered by it, were introduced in various sectors of the national economy. The assignments on autogenous methods of smelting copper-bearing concentrates at the Balkhash Mining and Metallurgical Combine and the Irtyshsk Copper Smelting Plant were accomplished. In all 11 inventions were accepted for patenting, 4 objects were proposed for patenting abroad, a license agreement was concluded, and 2 interbranch scientific technical complexes were established.

The coordinating functions of the academy were strengthened, the network and structure of scientific councils and commissions for urgent problems are being improved. Two educational scientific production associations began to operate. The presidium of the academy became appreciably more active, the activity of its departments was enlivened somewhat.

But there are no grounds for complacency and placidity. On the contrary, directions and sections, which are still not encompassed or are poorly encompassed by the process of restructuring and, therefore, are not yielding the desired results, are appearing clearly. For a long time negative trends accumulated in the management and development of academic science of the republic. The atmosphere of inertia, irresponsibility, and forgiveness had the result that the managers of the subdivisions of the Academy of Sciences did not report back on the fulfillment of their duties to its presidium, personal and group interests superseded the state approach to the matter.

With allowance made for the achievements of domestic and world science and the prospects of development of the national economy it is necessary to develop advanced directions of research, which provide an outlet to the current main lines of scientific and technical progress. This is first of all work in the area of automated control systems, robotics, machine building and material science, the synthesis of multifunctional monomers and polymer materials, and genetic and cellular engineering, on the improvement of the structure of the economy, and on the analysis of social and national relations.

The state of the activity on introducing the results of research is arousing anxiety. On this matter the Party Control Committee attached to the CPSU Central Committee, which discussed the work of the academy, made special claims against its presidium. In this connection it is necessary to carry out the registration of rejected practical suggestions and developments and in necessary cases to consider the advisability of further actions on them. At the institutes it is necessary to have councils for the promotion of the introduction of new ideas and the results of research. For the present there is no activity in all this.

The concentration of forces and assets in the most important directions is still weak. Hardly anyone wanted to give up nonpriority and unpromising themes. One should look more deeply and specifically into the program of the restructuring of academic institutions and involve every scientific associate in the search for the most effective means.

Great tasks face the social sciences. The academy is called upon to make a significant contribution to the creation and consolidation in the republic of a climate of intellectual dynamism, to put into use broader social, ideological, theoretical, and moral criteria, and to indicate new methods and means of the active formation of social consciousness, as well as the spiritual and material needs of the population.

Unfortunately, the academy still has too few long-range goal programs, it was stated at the session. For the purpose of the complete use of mineral raw materials the suggestion was made to formulate the Mineral Resources Program. This is also connected with the fact that the existing republic Ore, Mineral Raw Materials, and Karatau Programs are of a local nature and do not ensure the adequate comprehensiveness and effectiveness of research. The Mineral Resources Program, which is aimed at the waste-free production and extraction of all the valuable components of raw materials, is called upon to speed up significantly the restructuring of republic science as a whole and to increase its influence on scientific and technical progress.

The academy has to complete already next year an entire set of studies on the problem of Lake Balkhash, which 20 scientific institutions are conducting. Here it is necessary to use the experience of the Institute of Limnology of the Siberian Department of the USSR Academy of Sciences on the preservation of Lake Baykal. The problem of the Ili-Balkhash region should be solved on a strictly scientific basis, which eliminates the possibility of any libertarian decisions.

The academy must also take a most active part in the development of the Caspian Petroleum- and Gas-Bearing Region. Five specialized laboratories, which are making it possible to intensify significantly the research on the geology of petroleum and gas and to determine the productivity of a structure with the use of advanced

geophysical methods, were set up for this purpose. The Institute of Petroleum and Natural Salts Chemistry should also deal in earnest with the problems of increasing the petroleum recovery of formations.

In the structure of republic industry the share of machine building is unjustifiably low, the introduction of robotics is at the very beginning stage. Here, too, scientists of the academy are called upon to do much. Further the vital questions of the improvement of the technology of producing phosphorus, fertilizers, and fodder phosphates and the lag of Kazakhstan biologists in the area of genetic engineering were discussed. Information science, which is a lever of many achievements in practically all areas, is growing more and more rapidly in the world. The corresponding work at the republic academy should undergo further development.

The establishment of temporary scientific collectives made up of staff members of the Institute of Nuclear Physics and institutions of the Ministry of Health of the republic could prove to be an effective form of cooperation for the solution of urgent problems of medicine. In the system of earthquake prediction attention should be directed to the new data on the use of electromagnetic changes in the lower layers of the ionosphere. The integration of the work of the institutes of seismology and the ionosphere is necessary here.

If specific steps are not taken now in the reform of the structure and themes of scientific institutions of the republic, this will prevent them from keeping pace with modern scientific and technical progress. It is important here to display inventiveness and the ability to use quickly the latest achievements of world and domestic science for the solution of both scientific and practical problems, it was noted at the session.

In describing the activity of the Social Sciences Department, the speakers noted its high level of provision with doctors and candidates. However, their scientific output is insufficient. Whereas it is possible to some extent to explain the low efficiency of the work of scientists of natural science and technical specialties by the shortage of equipment and difficulties of introduction, for social scientists everything depends on their competence and ability to work purposefully and conscientiously on the posed tasks. They should set to work more vigorously on the priority directions of materialistic dialectics and the logic of scientific knowledge and social activity and on the comprehensive study of social class, international, and national relations in the name of the further convergence of the peoples of the USSR and the strengthening of their friendship and fraternity on the basis of socialist internationalism.

Unified planning, which encompasses various directions in the activity of institutes, has been introduced in the Social Sciences Department. The policy of publishing fundamental generalizing works like the 10-volume "Tolkovyy slovar kazakhskogo yazyka" [Explanatory

Dictionary of the Kazakh Language] and the 5-volume "Dialekticheskaya logika" [Dialectical Logic] has been adopted. Here the work within comprehensive programs is being intensified, and it is necessary to ensure it a high quality. A comprehensive program of research on the improvement of national relations under present conditions is being formulated for the coordination of efforts within the department. The theme "The Development of National Relations in Kazakhstan Under the Conditions of the Improvement of Socialism" and two new sections in the theme "The Kazakh Nation Is a Fundamental Part of the Soviet People" have been included in it.

At the session the criticism, which was leveled by the Central Committee of the Communist Party of Kazakhstan at the Institute of Linguistics, which was behind in the publication of dictionaries and phrase books, was deemed justified. Linguists and all social scientists should join more actively in the work on the improvement of the study in the republic of the Kazakh and Russian languages.

The improvement of the material and technical supply of the academy, it was noted at the session, is important for restructuring in science. In the level of supply with equipment and a pilot experimental base the republic Academy of Sciences was in one of the last places in the country. The lag in this matter was aggravated by the fact that the directors of many institutes did not put new equipment into operation in good time. Now a commission for the checking of the efficiency of its use is working. The supply with computer and other equipment is improving, but the question of an experimental base is urgent. Only the institutes of the Chemical and Technological Sciences Department have such a base, but it took 7 years to build and has taken the same number of years to assimilate.

The changeover to the new system of the remuneration of labor has been carried out in the system of the academy. At its institutes 55 structural subdivisions have been eliminated, 74 laboratories and groups have been united, a large number of staff members have been cut or demoted, the salaries of some have been reduced, while the freed wage fund has been used for the increase of the wage and the promotion of those staff members, who are making a more significant contribution to science. Nevertheless at many institutes this changeover was carried out formally, without a careful analysis.

The Presidium of the Academy of Sciences and the party organization have formulated and are implementing measures on the improvement of political and scientific organizational activity, the introduction of research results, the development of the inventing and patent services and capital construction, and the tightening up of the monitoring of financial and economic activity. Since the fall of last year the members of the presidium, including the vice presidents and academician secretaries, have been compiling a long-range plan of their work

for each quarter. A lecture bureau for urgent questions of modern science has been set up at the House of Scientists. The Club of International Contacts is operating at it.

Jointly with the collegiums of the republic Ministry of Higher and Secondary Specialized Education, the Ministry of Health, and the Ministry of Nonferrous Metallurgy the results of the fulfillment of joint work during the 11th Five-Year Plan were summarized and the plans of research for the present five-year plan were approved. In the interests of strengthening the contact of institutes of the Academy of Sciences and the republic Ministry of Higher and Secondary Specialized Education a number of affiliates of chairs were organized, which is increasing the level of training of specialists. The structure of the scientific councils attached to the presidium of the academy was revised. They are called upon to ensure the coordination of the efforts of not only their own institutions, but also the scientific potential of higher educational institutions and sectorial research institutes.

The scientific views and principles of many staff members formed back during the years of graduate studies and to date have not undergone substantial changes. But many of the former problems have lost their urgency. The rapid reorientation of scientists toward modern directions is required. That is why the efficiency of the work of directors of institutes will be evaluated not only according to the number of defenses of dissertations, submitted applications, and received inventor's certificates, but also according to the overall level of activity among other similar institutions of the system of the USSR Academy of Sciences. Here research should have pronounced individuality and conform to the best union standards.

The preparation of a reserve of personnel for promotion with allowance made first of all for professional competence, political maturity, and organizing qualities is being carried out. A decree on creative youth collectives at the republic academy was approved a few days ago. About 10 creative youth collectives are being established at its institutes. Young scientists must be systematically sent to institutes of the USSR Academy of Sciences for the improvement of skills. But far from all institutes are taking this opportunity.

Questions of the selection, placement, training, and increase of the skills of scientists were raised pointedly in the statements. Their increase is occurring slowly. There are still too few doctors of sciences, moreover, these are mainly middle-aged people. Hardly any of the leading scientists of the older generation have students, who today could continue and develop at a modern level their scientific direction. The institutes of the academy are formulating the Personnel Program to 2000, in accordance with which it is proposed to train not less than

600 scientific associates in 104 specialties. It is necessary to concentrate this important matter mainly at institutes which have doctors of sciences and a modern research base.

For the present hardly anything is being done for the intensification of research. It is necessary to increase the "efficiency" of the scientist not only by the more complete use of his working time, but also by the increase of the amount and profundity of the information that is obtained by him per unit of time. For this he should be furnished with modern laboratory equipment and instruments and experiments and data processing should be automated as much as possible.

As Comrade M.S. Gorbachev stressed at the January (1987) CPSU Central Committee Plenum, in order to become an active participant in restructuring, science itself in many respects should be restructured. Whoever does not lead in scientific ideas risks lagging behind in everything.

In characterizing the priority nature of the research being conducted, the speakers emphasized that the radical, fundamental reorientation of themes for a number of institutes has not yet occurred. Inertia and a peaceful life by means of traditional work are making themselves felt. The idea advanced by the USSR Academy of Sciences—the formulation of forecasts and the long-range planning of basic research—for the present has not undergone development in the republic. The departments and scientific councils for problems need to participate more actively in this work and to improve the coordination of the efforts of scientists.

The research of the Institute of Mathematics and Mechanics was commended. But even more attention has to be devoted to computational mathematics and mathematical simulation, as well as to the hardware and software of computing processes with the application of new principles of the use of hardware. Significant forces have been concentrated on the solution of the problems that are connected with this. The results of this work will be used when setting up computer networks and for the optimization of the processes of production management, the processing of aerospace information, and the simulation of the processes of air pollution.

The promise of this and other research is backed by the appropriate material and technical base. Astrophysical research will undergo further development. The high level of the optical probing of the earth's atmosphere is confirmed by the participation of our Astrophysics Institute in the All-Union Space Scientific and Technical Program and by the study of the problems of laser detection and ranging jointly with leading scientific institutions of the country. With respect to giant planets the institute is acting as the coordinating institution in the all-union program of the study of planets and asteroids.

The development of a completely automated X-ray diagnostics complex will ensure the efficient monitoring of the state of near-earth space, which is important for the solution of fundamental problems of solar-earth physics and the propagation of radiowaves in case of ground and space radio communications. This is the task of the Institute of the Ionosphere.

Such important scientific directions as machine science, applied mechanics, automation, and instrument making should undergo more intensive development owing to the planned organization of new institutes. Research in the area of chemistry, geology, and biology should be raised to a higher level. The institutions of the Earth Sciences Department should provide fundamentally important developments in the area of the assimilation of mineral raw materials and sources of water and the laws of the occurrence of minerals.

At the Institute of Geological Sciences work will be performed in a new direction—the comprehensive study of the most important mining regions of Kazakhstan—in the Dzhezkazgan-Ulatau and Turgay regions, as well as in the Rudnyy Altay, Karatau, and the region of the Balkhash Segment. The geology of petroleum and gas deposits has been singled out as an independent direction.

Along with traditional developments, which have received practical use, the Institute of Mining is concentrating its potential on the creation of an advanced complex of underground electric mining machines. The research in the area of a continuous technology of the underground mining of hard ores with the use of automatic manipulators is being expanded.

In the past several years the Institute of Geography has been seeking means of intensifying research. During this five-year plan its staff members will concentrate efforts on the study and forecasting of water and snow-ice resources and spontaneous destructive processes in mountainous regions, as well as on the forecast of possible changes in natural and natural technical complexes in regions of promising development. And, of course, the most important problem for this institute is the problem of the Balkhash.

The institutes of the Chemical and Technological Sciences Departments are called upon to increase the influence on the complete use of mineral raw materials and to develop the fundamental bases of the creation of new energy- and resource-saving waste-free technologies and materials, which meet the requirements of industry, agriculture, and medicine. It is proposed to develop fundamentally new concentrated fertilizers in the form of polymer phosphates, which have increased agrochemical efficiency.

Monomers and polymers have to be developed more actively with the use of nontraditional sources of renewable energy, particularly solar energy, for the needs of the national economy of the country.

Research, which is aimed at the finding of new effective means of synthesizing valuable physiologically active substances, will also be developed. It is planned to set up a pilot industrial works for the technology of the complete metallurgical processing of phosphate and silicon rare-metal raw materials on the basis of the Novodzhambul Phosphorus Plant.

Work on the pilot industrial and industrial testing and introduction at the Pavlodar Aluminum Plant of new technology is planned for solving the problem of the raw material base of the alumina sector.

Scientists of the Institute of Organic Catalysis and Electrochemistry, whose leading position in a number of directions is indisputable, will give new momentum to studies of the principles of the theory of the prediction of catalytic action for the purpose of the development and introduction of a new generation of catalysts, the development of the theory and methods of the combined protection of metals and alloys against corrosion, and so on.

One of the outlying institutions of the Chemical and Technological Sciences Department—the Institute of Petroleum and Natural Salts Chemistry—is in a difficult situation. One should in the shortest time help it with personnel and determine the basic directions of research with allowance made for the interests of the region. In speaking about the Central Kazakhstan Department of the academy, the speakers emphasized that it is slowly turning to face the needs of the region and is not performing its role of a coordinating center. The construction of new large mining and ore dressing combines, which is being planned, and the increase of the capacities of operating ones urgently require of scientists of the department the improvement of the technologies and equipment of the mining of minerals, which are being used, and the development of new ones.

The Biological Sciences Department, the largest in number of the scientific subdivisions, is working on a wide range of questions, which pertain to the implementation of the Food Program and to the improvement of health care. Physical chemical biology and biotechnology are represented for the most part only at the Institute of Molecular Biology and Biochemistry. Its research is aimed at the development of advanced methods of obtaining stock forms of plants and breeds of animals with improved economic attributes and at the development of new physiologically active compounds for medicine, industry, and agriculture. These problems should also receive elaboration at other institutes. It should be noted that this is the only institute of the academy, which

is conducting research within the Comprehensive Program of Scientific and Technical Progress of the CEMA Member Countries to 2000.

The protection and comprehensive use of the plant and animal world of Kazakhstan under the conditions of the intensive development of the national economy remain priority directions for botanists and zoologists.

Microbiologists and virologists must intensify the study of the metabolism of microorganisms as the biotechnological basis of the intensification of existing microbiological works and the development of new ones and environmental protection. A number of urgent problems face physiologists and representatives of other sciences.

Corresponding Member of the Republic Academy of Sciences V.N. Okolovich, academician secretary of the Physical and Mathematical Sciences Department, in his statement emphasized the complexity of restructuring in science and the need to treat it with full responsibility. Not all scientists have realized the importance of work in the new way, in the spirit of the times. In the department a survey on questions of the intensification of science was conducted, the institutes formulated their own specific programs of restructuring. Here the changeover to such forms of the organization of work, which would make it possible with relatively stable expenditures and a smaller number of people to obtain more significant results for science and practice, is playing a special role.

We have to increase substantially the qualitative indicators of VUZ science, Acting Republic Minister of Higher and Secondary Specialized Education V.A. Kolesnikov said. The changeover of industrial enterprises to new forms of economic activity is contributing to this. We will reject more resolutely the focus on petty themes and will attain the solution of major sectorial problems. For this it is planned to expand the network of laboratories, to use more often in practice the surveying of enterprises by VUZ scientists and the issuing of recommendations, and to strengthen the contact with academic science.

Academician of the Kazakh SSR Academy of Sciences T.A. Ashimbayev, director of the Institute of Economics, posed the question of the need to strengthen the goal orientation of the research of economic scholars, which is especially important in connection with the forthcoming adoption of the Law on the Socialist Enterprise (Association). At our institute, the speaker said, some experience of work on orders has been gained, which is facilitating the introduction of the results of research. Further he made the suggestion to use the practical experience of state acceptance in the scientific sphere as well.

We have enough skilled personnel for the successful solution of major problems, Academician of the Kazakh SSR Academy of Sciences A.A. Abdulin, academician secretary of the Earth Sciences Department, noted in his statement. But scientific schools are needed so that

prominent scientists would emerge from their midst. The stable collectives of institutes, which have been working for a long time in accordance with a unified, thoroughly substantiated program, are called upon to become them. The speaker named as one of the most important tasks for the department the centralization of the forces and assets, which are being channeled into research and prospecting operations in the field of geology on the scale of the republic, and their comprehensive connection with the fundamental requirements of the national economy.

Restructuring here is proceeding slowly, Academician of the Kazakh SSR Academy of Sciences A.N. Ilyaletdinov, academician secretary of the Biological Sciences Department, stated. The main directions of research have not been clearly specified at all the institutes. The genetic research, which is being conducted at the Institute of Botany, is arousing particular anxiety. They are remaining aloof of the main direction of plant genetics—the development of the scientific principles of strain formation. Changes in the very approach to the problems and to the intensification of the labor of zoologists and botanists are needed. The essence of intensification lies in the acceleration of the computer-aided processing of the results.

We have focused efforts on promising directions—instrument making and solid-state physics, nuclear physics and applied research, Acting Director of the Institute of Nuclear Physics A.K. Zhetbayev said. But changes in the organization of work are needed. It is necessary to strengthen the contact between laboratories and to improve the use of equipment. Engineering facilities, many of which need renovation, await greater attention and concern.

For the better establishment of contact with chemical production of the republic we have sent brigades of scientists to plants in Dzhambul, Chimkent, Mangyshlak, and Guryev oblasts, Academician of the Republic Academy of Sciences B.A. Zhubanov, academician secretary of the Chemical and Technological Sciences Department, said. Joint plans of work on questions of the concentration of raw materials, the production of phosphorus fertilizers, and ecology have been drawn up. The first steps have been taken for integration with all-union engineering intersectorial centers. The Republic Tsvetnaya metallurgiya Scientific Technical Complex is being established.

In his statement Academician of the Republic Academy of Sciences A.S. Saginov, rector of Karaganda Polytechnical Institute, analyzed the problems facing the scientists of the higher educational institution. The lack of a pilot experimental and design base, the inadequate coordination of research, which is of an interdepartmental nature, and the shortage of measuring and microprocessor equipment and computer-aided design systems are checking the obtaining of an economic impact from their

developments. It is necessary to display more persistence in the organization of affiliates of chairs at enterprises and in the establishment of sectorial scientific research laboratories.

The establishment of interbranch scientific technical complexes is called upon to speed up the introduction of scientific developments in production and will help to eliminate many distortions in the development of science. Corresponding Member of the Republic Academy of Sciences G.D. Zakumbayeva, chief of a laboratory of the Institute of Organic Catalysis and Electrochemistry, said. The successes in the area of catalytic hydrogenation and in other areas served as the basis for the inclusion of our institute in the Katalizator Complex, in which another two institutes of the academy, union ministries, and their sectorial institutes have been included. Its work will make it possible to decrease and by 1993 to halt the purchase abroad of catalysts which are important for our enterprises. But we need support in the establishment of a shop of laboratory units.

In his statement I.A. Karapatnitskiy, senior scientific associate of the Institute of High Energy Physics of the Republic Academy of Sciences, raised urgent questions of the stimulation of young scientists. It is necessary to increase the concern for their professional advancement, while for this it is necessary to increase the assistance to them on the part of senior comrades along with daily, ever increasing demandingness. The young associates of the institute need the support of their scientific initiative and research and the improvement of working and living conditions.

First Secretary of the Central Committee of the Communist Party of Kazakhstan G.V. Kolbin in his statement at the session dwelt on the main directions of the activity of the academy and stressed the need to increase relentlessly its role in the accomplishment of the major and difficult tasks, which were posed for the republic by the decisions of the 27th party congress, the January (1987) CPSU Central Committee Plenum, and the 8th Plenum of the Central Committee of the Communist Party of Kazakhstan.

7807

Lithuanian State Prizes In Science, Technology For 1987

18140220 Vilnius SOVETSKAYA LITVA in Russian
21 Jul 87 pp 1, 3

[Article under the rubric "In the Central Committee of the Communist Party of Lithuania and the Lithuanian SSR Council of Ministers": "On the Awarding of the 1987 Lithuanian SSR State Prizes in Science, Technology, Literature, Art, and Architecture"]

[Excerpt] The Central Committee of the Communist Party of Lithuania and the Lithuanian SSR Council of Ministers, having considered the representations of the

Committee for Lithuanian SSR State Prizes in Science and Technology and the Committee for Lithuanian SSR State Prizes in Literature, Art, and Architecture, resolves to award the 1987 Lithuanian SSR State Prizes to:

In Science and Technology

Doctor of Chemical Sciences Professor Yu. Kulis, director of the Institute of Biochemistry of the Lithuanian SSR Academy of Sciences; Candidate of Chemical Sciences V. Razumas, chief of the Sector of Bioelectrochemistry of the Laboratory of Enzyme Chemistry of this institute—for the series of works "The Bioelectrocatalysis of Organic Compounds" (1974-1986).

Doctor of Physical Mathematical Sciences Professor L. Pranyavichyus, chief of the Chair of Physics of the Radio Electronics Faculty of Kaunas Polytechnical Institute imeni Antanas Sneckus—for the series of works "Ion Implantation in Semiconductors and Dielectrics" (1976-1986).

Doctor of Physical Mathematical Sciences A. Aleshkya-vichene, chief scientific associate of the Institute of Mathematics and Cybernetics of the Lithuanian SSR Academy of Sciences; Doctor of Physical Mathematical Sciences V.-K. Bentkus, leading scientific associate of this institute; Doctor of Physical Mathematical Sciences R. Bentkus, chief of the Sector of the Analysis of Time Series of this institute; Vice President and Full Member of the Lithuanian SSR Academy of Sciences V. Statulavichyus, director of this institute; Doctor of Physical Mathematical Sciences A. Tempelman, chief scientific associate of this institute—for the series of works "The Asymptotic Analysis of Functionals of Random Processes, Statistical Estimates, and Their Distribution."

Candidate of Technical Sciences E.-V. Daumantas, docent of the Chair of Silicate Technology of the Chemical Technology Faculty of Kaunas Polytechnical Institute imeni Antanas Sneckus; A. Drobavichyus, senior instructor of the Chair of Thermal Power Engineering of this institute; Candidate of Technical Sciences Professor A. Novodvorskis, prodean of the Chemical Technology Faculty of this institute (posthumously); Doctor of Technical Sciences Professor Yu. Tsiparis, Vilnius State Pedagogical Institute—for the textbook "Protsessy i apparaty khimicheskoy tekhnologii" [Processes and Equipment of Chemical Technology] (Vilnius, "Mokslas", 1984).

Corresponding Member of the Lithuanian SSR Academy of Sciences V. Domarkas, rector of Kaunas Polytechnical Institute imeni Antanas Sneckus; G. Ilyukevich, leading engineer of the Vilnius Scientific Research Institute of Radio Measuring Instruments; Doctor of Technical Sciences E. Piletskas, acting professor, chief of the Chair of Electronics of Kaunas Polytechnical Institute imeni Antanas Sneckus; V. Slatin, deputy chief process engineer of the Vilnius Plant of Radio Measuring Instruments imeni 60-letiya Oktyabrya; V. Starikov, chief of a

scientific research sector of the Vilnius Scientific Research Institute of Radio Measuring Instruments; K.-V. Syaurusaytis, chief of a scientific research division of this institute; M. Timen, chief of the Bureau of New Equipment of the Vilnius Plant of Radio Measuring Instruments imeni 60-letiya Oktyabrya; Candidate of Technical Sciences S. Chervyakov, chief of a scientific research sector of the Vilnius Scientific Research Institute of Radio Measuring Instruments; C. Chernykh, leading design engineer of this institute—for the development and industrial introduction of modern medical ultrasonic diagnostic equipment.

Candidate of Technical Sciences Docent B. Krishchyunas (supervisor of the work), chief of the Kaunas Territorial Administration of Water Supply and Sewer Maintenance; S. Baltrushaytis, chief of the Operation Sector of the Division of Plant Technical Management Automation Systems of this administration; R. Vaytkyavichyus, electrician and brigade leader of the shop of measuring instruments of this administration; G. Dvirnyy, manager of a group of the Department of the Automation of Technology of the Institute of Planning of Municipal Services; P. Margyavichyus, chief of the shop of measuring instruments of the Kaunas Territorial Administration of Water Supply and Sewer Maintenance; K. Mike, chief project engineer of the Institute of Planning of Municipal Services; V. Pyatrauskas, chief of the Division of Plant Technical Management Automation Systems of the Kaunas Territorial Administration of Water Supply and Sewer Maintenance; A. Regelskis, chief engineer of the Department of the Automation of Technology of the Institute of Planning of Municipal Services; R. Shcherbinskas, supervisor of the Maintenance Sector of the Division of Plant Technical Management Automation Systems of the Kaunas Territorial Administration of Water Supply and Sewer Maintenance—for the work "The Automated Monitoring and Control of the Water Supply System of Kaunas. With the Use of Computer Complexes and Communications Complexes" (1973-1986).

Corresponding Member of the Lithuanian SSR Academy of Sciences A. Prashkyavichyus (supervisor of the work), rector of the Kaunas Medical Institute; Doctor of Medical Sciences Professor A. Vitkus, chief of the Chair of Histology, Embryology, and Pathological Anatomy of this institute; Doctor of Medical Sciences Yu.-S. Danilyavichyus, acting professor of the First Chair of Internal Diseases of this institute; Candidate of Biological Sciences P. Dzheye, senior scientific associate of the Laboratory of Metabolism of the Central Scientific Research Laboratory of this institute; Candidate of Biological Sciences L. Ivanov, chief of the Laboratory of Pathochemistry of the same laboratory attached to this institute; Candidate of Medical Sciences L. Lukoshyavichyus, docent of the Chair of Biological and Organic Chemistry of this institute; Doctor of Medical Sciences Professor R.-S. Stropus, prorector for scientific work of this institute; Candidate of Biological Sciences Docent A. Toleykis, chief of the Laboratory of Metabolism of the

Central Scientific Research Laboratory attached to this institute—for the series of works "The Laws of Biochemical and Morphological Disorders of Organs and the Peculiarities of Their Development in Case of Hypoxia (Experimental Myocardial Infarction)" (1965-1985).

Candidate of Medical Sciences Docent R. Basyavichyus, dean of the Faculty of Theoretical Medicine of the Kaunas Medical Institute; Candidate of Medical Sciences V. Budnikas, docent of the Chair of Pharmacology of this institute; Candidate of Medical Sciences V. Volbekas, docent of the same chair of this institute; Doctor of Medical Sciences G. Mituzas, professor of the Chair of the Advanced Training of Pharmacists of this institute; Doctor of Medical Sciences Professor A. Mitskis, chief of the Chair of Pharmacology of this institute; Doctor of Medical Sciences Professor G. Polukordas, chief of the Chair of Pharmacology and Microbiology of the Medical Faculty of Vilnius State University imeni V. Kapsukas (posthumously); Candidate of Medical Sciences Yu. Ramanauskas, docent of the same chair of this university; Candidate of Medical Sciences M. Repchite, docent of the same chair of this university; Candidate of Medical Sciences A.-M. Urmonene, docent of the Chair of Pharmacology of the Kaunas Medical Institute—for the textbooks "Farmakologiya" [Pharmacology], 1st and 2d editions (Vilnius, "Mokslas", 1983, 1986) and "Farmakologiya i retseptura" [Pharmacology and Prescription Filling] (Vilnius, "Mokslas", 1986).

Kh. Lemkhenas (supervisor of the work), senior science editor of the editorial board of dictionaries of the Mokslas Publishing House; Candidate of Philological Sciences Ya. Kardyalite, senior science editor of this editorial board; A. Mankyavichene, senior science editor of this editorial board; Y. Matsaytis, senior science editor of this editorial board—for "Russko-litovskiy slovar" [A Russian-Lithuanian Dictionary] (Vilnius, "Mokslas", 1982-1985).

A. Zablatkas, chief of Alitus Road Construction Administration No 8 of the Ministry of Motor Transport and Highways; V. Imbrasas, chief of the Technical Division of the Republic Production Administration of Roads of the Ministry of Motor Transport and Highways; First Deputy Minister of Motor Transport and Highways P.-K. Markitskas; Ch. Radzinauskas, chief of the Republic Production Administration of Roads of the Ministry of Motor Transport and Highways; B. Semenov, chief project engineer of the Lithuanian State Institute for the Surveying and Planning of Roads of this ministry; Y. Furmanavichyus, chief engineer of this institute; A. Chernyauskas, chief of a road construction trust of the Ministry of Motor Transport and Highways; A. Yankauskas, chief specialist of the Road Department of the Lithuanian State Institute for the Surveying and Planning of Roads of this ministry; First Deputy Chairman of the State Planning Committee G. Yatskyavichyus—for the introduction of scientific and technical progress in the planning and construction of roads of the Lithuanian SSR.

E. Avenas, crane operator and brigade leader of the Taurage Experimental Timber Management; Yu. Zhu-kauskas, leader of a brigade of repair mechanics of the heat-treating shop of the Vilnius Plant of Drills; F. Kazak, leader of a brigade of tool makers of the Vilnius Order of Labor Red Banner Plant of Electric Welding Equipment of the Vilnyuselektrosvar Production Association; E. Karalene, knitter of the Telshyay Mastis Knitwear Production Association; A. Navitskas, chief of the Technical Department of the Mazheykyav Construction Trust; I. Pashkyavichyus, chief project designer of the Planning and Design Bureau of Furniture of the Ministry of the Furniture and Paper Industry; A. Ulyatskene, cook of the Draugiste Restaurant of the Cost Accounting Association of Public Dining Enterprises of the Kapsukas City Consumers' Society; L. Khomutova, foreman of the Zheymyana Sewing Factory—for outstanding achievements in labor and socialist competition, for the increase of labor productivity and production efficiency.

S. Beynoris, cattleman of the Grizhuva Kolkhoz of Kelmeskiy Rayon; E. Zhernene, cattlemaster of the Pazhanga Kolkhoz of Mazheyskiy Rayon; S. Lelyuge, lathe operator of the section of accessories of the Plunge Machinery and Repair Plant; A.-S. Lengvinene, milkmaid of the Yaunoyi gvardiya Kolkhoz of Kretingskiy Rayon; Yu. Medzykyavichyus, leader of a multiple-skill brigade of the Kaunas Order of Labor Red Banner Meat Combine; M. Petyarene, worker and field crop grower of the Shapalay Vegetable Growing Sovkhoz of Vilka-vishskiy Rayon; S. Urnezhyus, leader of a multiple-skill brigade of the Shilutskiy Rayon Construction Organization; M. Yuknyavichyus, tractor driver and machine operator of the Merkis Experimental Farm of Trakayskiy Rayon—for outstanding achievements in labor and socialist competition, for the increase of the production of agricultural products and the improvement of their quality.

Evaluation Of Work Of Scientific Institutes, Scientists

18140217 Yerevan *KOMMUNIST* in Russian 12 Apr 87
p 2

[Article by Candidate of Technical Sciences V. Chalabov under the rubric "Restructuring: By the Routes of Scientific and Technical Progress": "Certification or 'Stock Taking'?"]

[Text] The strategic task of accelerating the scientific and technical progress of the country predetermines the sharp turn of science toward the needs of practice. In this area many urgent basic problems still have to be solved. First of all a mechanism, which ensures the mutual interest of scientists and production workers, is needed. Such a mechanism today is already beginning to be formed. About half of the creative engineers and nearly all applied scientists are concentrated at sectorial scientific research institutes and design bureaus, which have legal and cost accounting independence. The planning

and evaluation of the work of these institutions and their financial well-being, or, using prosaic language, the availability of money at the cashier's office and the timely payment of wages to the workers, are connected very little, and at times not at all with the end result of the work, in which they perform only the first operations. The plants, which are the producers of new equipment, complete it.

In the relatively recent past developers constituted an integral fundamental part of plant collectives. Later they removed them from the staffs of enterprises and on their bases established numerous independent scientific research institutes and design bureaus. This was also done for the purpose of improving the indicator of labor productivity of the department, an indicator which, as is known, is determined by dividing the volume of produced output by the number of workers. **This formal and, at first glance, innocent technique, first, gave a wide road to the poorly controlled increase of the staffs of scientific research institutes and design bureaus and, accordingly, to the decrease of the output of workers. And, second, it has an adverse effect on the connection between the evaluation indicators of the activity of scientific research institutes and design bureaus and the economic impact from their activity. They were replaced by intricate calculations of "the conditional saving."**

Not a finished machine or technology, but drawings, reports, and other technical specifications...have become the product of the majority of cost accounting scientific research institutes and design bureaus. Payment for it is made in accordance with price handbooks subject to the format, the number of drawings, and their "group of complexity." **As a result it turns out: the more paper products there are and the more complex they are, the more revenues the cost accounting design bureau has.**

Starting this year a period of the extensive introduction of organizational measures, which are aimed at changing the existing system of the material stimulation of the labor of scientists, with the decrease of the dependence on an academic degree, began. The elimination of the "degree" qualification is facilitating the attraction to science of talented engineers from production.

"Restructuring is the decisive turn toward science, the business partnership with it of practice for the purposes of achieving the highest end results, the ability to place any initiative on a solid scientific basis, the willingness and ardent design of scientists to actively support the policy of the party of the modernization of society; at the same time this is concern for the development of science, the increase of its personnel, and their active participation in the processes of transformations," it was stressed at the January (1987) CPSU Central Committee Plenum.

The goal of the new system of the remuneration of labor was posed—to increase sharply the interest of scientists in the end result of their efforts and to cut short the

high-paid "somnolence" of those scientists who long ago lost their creative potential. The certification of scientists, which is being carried out, is called upon to become an effective means for achieving this goal. The new system of the remuneration of labor will concern sectorial scientific research institutes and will encompass all staff members of academic institutes.

It is understandable that far from everyone likes such an exacting approach. For certification touches on what is closest to a person: his professional honor, authority, moral qualities, and, finally, material status. It is possible to call certification a test for social and professional maturity—the possibility to make the principle "to each according to his labor" really effective. Moreover, to do this with the participation of the labor collective, openly, in full conformity with the democratic norms of our life.

At the Institute of Agrochemical Problems and Hydroponics of the republic Academy of Sciences they prepared for carrying out certification. Director S. Mayrapeyan told one of the staff members that his chances of successfully passing the certification were close to zero and it was better to try to find in good time a new place of work. The latter decided that this was a joke. But the director was serious and believed that there was every reason for that: the staff member did not have published works, the level of the themes being performed was low, he did not have public assignments....

Previously, before the new currents in the evaluation of labor, the director of the institute would not have decided on such a harsh step. He would have tried to avoid emotional scenes and telephone calls. It was considered tactless to openly call a staff member a loafer.

Now is a time of precise estimates of the contribution of each person. But here objectivity, a businesslike approach, openness, and competence should be observed.

When you become familiar with the materials of the certification of scientists, engineering and technical personnel, and specialists of scientific research institutions and design, technological, planning, surveying, and other organizations of science, you sense that many collectives are attempting to get rid of negligent workers and to combat "guaranteed" wage rates, which are not connected with the personal labor contribution, and against "unwarranted leveling," when the labor of a good and a negligent worker are paid for identically. **Unfortunately, at some scientific institutions certification was purely formal. Certification commissions were set up, people were diverted from work, piles of documents were formed, and conflicts, which led to nervous shocks, complaints, and letters, for the checking of which people were also diverted, arose.**

Did certification affect anyone properly? Mainly workers of retirement age and several scientific associates, who had worked not in their specialty at the given institution. There are also such instances, when, for

example, they made a senior scientific associate a scientific associate, without changing the wage. But this is not easy—to take money from one person and to give another a raise. It is not easy first of all because this process involves the need for the change of the psychology of people.

If we return again to the scientific collective—the academy's Institute of Geological Sciences, practice itself has confirmed the correctness of the measures being implemented. Here 298 people had to be certified. But as soon as what was coming became known, 34 people submitted resignation notices. Five staff members were not certified. Eleven were demoted.

Thus, certification increased the tendency for labor efficiency to increase. The decrease of the number of workers in laboratories and departments will comprise the fund, from which assets will also be drawn to give incentives to staff members in conformity with their specific contribution.

It is clear how important the question of the criteria of the evaluation of scientific labor and its results is when carrying out certification. In their absence, as well as in the absence of an economic mechanism, which determines the impact, the probability of subjectivism in differentiating the wage of scientists appears.

All the more responsibility rests with those who are entrusted to carry out certification and to eliminate the instances, when it becomes a formal procedure, that is, a kind of stock taking of the existing potential. But let us face it, instances, when they do not certify a staff member, who is unwelcome to the authorities, despite the fact that there seem to be no objective grounds for this, still occur. And, on the contrary, a staff member, who is incapable and works poorly, but for some reasons suits the administration, does not have any complications.

The trouble is that so far effective generally acceptable criteria in the evaluation of the labor of workers of science have not been found, with the exception of the most general ones.

The atmosphere of openness, which has now been established in the country, is making it possible to discuss the questions of improving the remuneration of the labor of scientists as an economic, political, and psychological phenomenon.

The main thing today, obviously, is to develop an absolutely objective and effective method of evaluating the labor of the scientist. Of course, this is a difficult problem. But its solution must not be delayed. The new mechanism will be improved in case of the strict observance of social justice and the scientific use of the law of distribution according to the quantity and quality of labor.

Zakyr Zakirovich Zakirov

18140224 Tashkent PRAVDA VOSTOKA in Russian
25 Nov 86 p 3

[Article: "The Search Continues. Academician of the Uzbek SSR Academy of Sciences K.Z. Zakirov Is 80 Years Old"]

Honored Figure of Science of the Uzbek SSR, winner of the Beruni Prize, academician of the republic Academy of Sciences—not only these titles specify the creative path of Kadyr Zakirov. He belongs to the pleiad which was at the source of the state of a new type—the Soviet Union. He was born in the family of a handicraftsman in the settlement of Dzhahalabad of Fergana Oblast. In 1920 he joined komsomol. In the Koshchi league he was responsible secretary of the city cell and a member of the buro of the okrug Komsomol committee, in special units with weapon in hand he defended the gains of the revolution, he traveled all over the Fergana Valley by the routes of food requisitioning, he fought for the implementation of land reform and the elimination of illiteracy and actively spoke out against reactionary traditions and rituals.

In 1925 the okrug Komsomol committee sent him to the Workers' Faculty attached to the Central Asian State University imeni V.I. Lenin. After graduating from it K. Zakirov enrolled in the Natural Science and Mathematics Faculty of the Uzbek Pedagogical Academy (now Samarkand State University imeni A. Navoi). At the very start of the path into science fate brought him together with talented scientists, enthusiastic researchers, and outstanding educators. Among them are Professors N.A. Merkulovich and S.A. Nevskiy, whose lectures instilled in students a love for nature and naturalistic observations.

Then K. Zakirov engaged in the geobotanical investigation of the natural fodder lands of the Nishanskiy Steppe. Their results were the basis of the large-scale land management operations of Giprozem. The obtained data served as material for a candidate dissertation, which was completed in 1936 in Leningrad. In subsequent research K. Zakirov studied the questions of the history of the development of the flora of Central Asia and other regions. In 1937 the scientist was appointed acting chief of the Chair of Botany of Samarkand University. In the same year on the order of the Uzbek SSR People's Commissariat of Agriculture he fit out a pasture botanical expedition for the basin of the Akhangaran. As a result of the 2-year study he compiled a detailed map and wrote an essay on the vegetation of the region.

The joint work of K. Zakirov during 1937-1941 with Corresponding Member of the Uzbek SSR Academy of Sciences Professor M.G. Popov contributed in many respects to the further formation of his scientific interests. During these years K. Zakirov was a docent of the Chair of the Taxonomy and Geography of Plants of the Central Asian (now Tashkent) University, where he

worked under the supervision of well-known botanist Ye.P. Korovin. In 1956 he successfully defended his doctoral dissertation in Leningrad. In 1952 he was elected corresponding member of the Uzbek SSR Academy of Sciences and was appointed director of the Institute of Botany. Since 1956 K. Zakirov has been an academician of the Uzbek SSR Academy of Sciences. During this period he has taken an active part in the editing and compiling of the six-volume work "Flora Uzbekistana" [The Flora of Uzbekistan] and has been developing the biological principles of the restoration of the karakul-raising pastures of the Southern Kyzylkumy.

In 1956 K. Zakirov was appointed rector of the Uzbek (now Samarkand) University imeni A. Navoi. A year later he returned to Tashkent as president of the Uzbek Academy of Agricultural Sciences. At that time the scientist advanced the idea of the development of the Karshi Steppe and the establishment of a new large cotton base. This idea was set forth in PRAVDA VOSTOKA on 30 December 1958 and received comprehensive support. K. Zakirov was the initiator of the organization of a number of new scientific research institutes of the agricultural type on the basis of existing experimental stations: the Central Asian Institute of the Mechanization and Electrification of Irrigated Agriculture, the institutes of rice, vegetable and melon crops and potatoes, dry farming, and cotton selection and seed growing. After the reorganization of the Academy of Agricultural Sciences in 1961 K. Zakirov devoted himself entirely to scientific work at the Institute of Botany of the Uzbek SSR Academy of Sciences.

The laboratory "The Search for Raw Material Plants" was established on the initiative of K. Zakirov. The goal was posed to enrich the assortment, to identify the reserves, to develop means of efficient use, and to map stands of raw material plants, which are suitable for commercial procurement.

But, understanding the need for not only the registration, but also the preservation of natural plant resources, Kadyr Zakirovich posed for the survey botanists a new task—to develop a forecast of the state of stands in case of the present system of use and if necessary to propose a new system of economic use, which ensures self-reproduction. Thus there arose a new direction in republic resource management—the study of the cenopopulations of basic raw material plants and the establishment of their ecological and phytocenotic optimum. This work was planned up to 2010. It is the scientific basis of the optimization of the use of natural raw material plants.

The conducted research made it possible to recommend for the commercial use of raw materials more than 30 essential-oil and aromatic spice plants.

Medicinal plant growing is being organized in the republic. A number of farms, which produce the most valuable medicinal raw materials, already exist. Kadyr Zakirovich is one of the initiators of the establishment of such

farms in Uzbekistan. The comprehensive study of licorice—one of the valuable medicinal technical plants—was begun in 1964. A technology of its cultivation has been developed. The academician and his students have identified highly productive and salt-tolerant natural forms. For the first time it was established that licorice is not only a valuable technical and fodder plant, but it can be cultivated in the same way as a reclamation crop of saline lands. The recommendations of the scientists were the basis of the decisions of a number of union and republic directive organs, farms are being set up in Uzbekistan, Kazakhstan, and Turkmenia, and a plan of the Solodka Interbranch Scientific Technical Complex is being drawn up.

The homeland has rated highly the services of Academician K. Zakirov. He has been awarded two Orders of Labor Red Banner and many medals.

Kadyr Zakirovich has devoted 6 decades to botanical science. And today, working as a chief scientific associate, he is supervising the drafting and implementation of

a plan of the radical reform of the structure and problems of the Institute of Botany of the Uzbek SSR Academy of Sciences, which is aimed at the intensification of the scientific research process and the speeding up of the introduction of the achievements of science in production.

[Signed] Academician of the Uzbek SSR Academy of Sciences A. Muzafarov, academician secretary of the Biological Sciences Department of the Presidium of the Uzbek SSR Academy of Sciences; Academician of the Uzbek SSR Academy of Sciences M. Mukhamedzhanov; S. Nigmatov, senior scientific associate of the institute; M. Allayarov, chief of the Department of Medicinal Plants of the Uzbek SSR Ministry of the Forestry Industry.

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